

The Automobile and WEEKLY MOTOR REVIEW

NEW YORK

SATURDAY, JUNE 7, 1902

PRICE 10 CENTS

A. C. A. Endurance and Speed Trials

MEMORIAL DAY, the holiday now observed as the formal opening of the season of summer sports, fell this year on Friday; giving two days instead of one, as most of the New York business houses were closed on Saturday. The Auto-

mobile Club of America availed itself of this opportunity for a double trial of its vehicles, on the first day for endurance and on the second day for speed. The details

of both contests were planned with the greatest care to avoid all violations of the speed laws, all infringements of the rights of others, and all liability to accident. The first day was in all respects successful, but the second was marred by a fatal accident,

tators by the roadside, killing two and wounding several more, the driver and his assistant escaping unhurt. The endurance run of Friday was over 50 miles of good roads, through a picturesque country and in pleasant weather



mobile Club of America availed itself of this opportunity for a double trial of its vehicles, on the first day for endurance and on the second day for speed. The details

which is in every way to be deplored. While running at a very high rate of speed, one of the new racing machines broke down and left the track, striking a group of spec-

for the outward and homeward trip. The starters, to the number of 55, included representative cars of the best American and foreign makes, the majority of these covering the 100 miles without a single stop. While the test, considering the weather and the condition of the roads, was by no means a severe one, the cars as a whole made a very creditable showing in endurance and regularity of running. There were no ac-

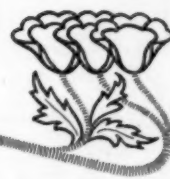
cidents, and such delays as occurred were due mainly to trivial causes. The management of the run by the officials of the club was in every way satisfactory, and the contestants, on their part, endeavored to comply with the laws and the club rules. The one difficulty that all experienced was in keeping down to the legal limits of speed, only eight miles for a large portion of the course. With all conditions favorable for reasonably fast running, even those who were in no sense scorers felt the restraint of a 15-mile limit on clear open roads. The run was eagerly watched by thousands of people, many being scattered along the roadside in the open country, while in every city and village the streets were thickly lined, both on the outward and return runs, by old and young of all classes. The fact that the contest was in no sense a race was not generally understood, and many were taking down the numbers of the cars and asking questions as to which was first. The general feeling was apparently one of interest and sympathy rather than of such hostility as is now manifested in so many quarters.

A continuance of the fine weather on Saturday, with the added attraction of high speed and promised record breaking, brought out a large number of spectators, while most of the finer cars from New York and its vicinity were present, with all the prominent New York motorists and many from other cities. The course itself, while not an ideal one for extreme speed, was the best available, and the arrangements were well planned and carried out. The policing, though entirely inadequate so far as keeping clear the full width of the roadway, was as good as it can be on such occasions, where the crowd will take any personal risks in order to see.

The running developed nothing sensational or specially interesting in the way of record-breaking. Fournier's record for the mile, made last November on the Coney Island Boulevard, still stands, as does Serpollet's more recent Nice record for the kilometer. Some of the less important records were broken, but the day was not remarkable for high speed. The sport was brought to a sad and abrupt termination by the collapse of the new Baker electric racing machine, as detailed further on. Apart from this unfortunate finale, the speed trials of the second day were in no way as interesting, instructive or educative as the endurance run of the first day.



The Endurance Test



The plans for the endurance run were made with several definite objects in view—a pleasant holiday outing for the club members, a practical everyday road test of the cars of 1902, and a public demonstration of the good points of the motor vehicle in its most improved form. Previous runs of the A. C. A. and other clubs had developed certain difficulties and troubles which in this case were to be avoided, both to increase the technical value of the results and to guard against accidents from careless driving or excessive speed. All ar-

per part of the city and out over the historic old Boston Post Road through Westchester County, skirting the shore of the Sound, through Larchmont, New Rochelle and Rye; over the state line into Connecticut and on through Stamford, Norwalk and Westport to a point 50 miles from the start, near Southport; the return being over the same route.

Classes of Starters

The run was open to all motor vehicles carrying at least two persons side by side on one seat, the starters being divided into three classes according to the power: explosive vapor, steam or electricity. All the cars with explosive motors were in one class; the steam cars were divided into two sub-classes, those entered for the full non-stop run and those making two stops for fuel and water; the electric cars were similarly subdivided, according to their entries, for the full non-stop run, a run with one stop for charging at 50 miles, or a run with two stops at 33 1-3 miles and 66 2-3 miles. At these official stops the cars were allowed only to replenish tanks and batteries, all repairs and adjustments being prohibited.

Conditions of the Run

Every car was expected to make the run without a stop except for the following causes: Tire troubles, police orders, timid horses, closed railroad crossing, blocking of the road, or demands of nature. To make certain the observance of these conditions, each car carried an official observer, representing the club, who was charged with the duty of recording all stops, supplies of fuel, accidents, etc., and of cautioning the driver as to the speed rules.

The course was laid out on the basis of an average speed of 15 miles, the legal limit in Connecticut. In all cities the cars were limited to 8 miles. To secure the proper enforcement of this regulation a control was established at Mianus, Conn., 33 1-3 miles from the start, and cars were forbidden to reach it in less than 2h. 15m. from the actual time of starting. They were allowed the same time for the next stage, to the turn and back to Mianus, with a



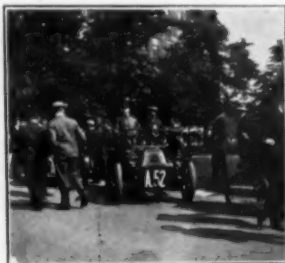
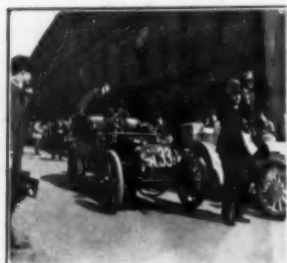
Getting Official Fuel Supply

rangements were in the hands of a special committee, including Messrs. Winthrop E. Scarritt, George F. Chamberlin, John A. Hill and Secretary Butler. It may be noted here that the work of this committee was well done, both in the preliminary planning and in the actual road management of the day. It is no reflection on the work of the other members to say that Mr. Scarritt was most earnest in his personal efforts for the success of the run.

The Route and the Vehicles

The full conditions have already been published, and it is not necessary to give them in detail. The course ran from the clubhouse at the Plaza, Fifth Ave. and Fifty-eighth St., New York, through the up-

FOUR HYDRO-CARBON MACHINES AT THE STARTING POINT OF THE ENDURANCE RUN



third interval of 2h. 10m. for the run back to the finish, making 640m. as the minimum time for the 100 miles. Any vehicle arriving at a control inside of the time limit was subject to disqualification. The only prizes were certificates for such cars as should make the run in accordance with the regulations.

Weighing in the Cars

The vehicles that entered the endurance contest and the speed trials were required to be weighed officially on Friday between 9 a. m. and 6 p. m. After presenting themselves and their vehicles at the clubhouse, on Fifth Ave., the operators were given two board frames covered with oilcloth, on which were painted the numbers by which the machines were to be designated in the events. They were then directed to a coal-yard at the foot of East Fifty-sixth St., where they were weighed on large outdoor scales. Five were weighed before noon and about forty in the afternoon. A number of machines failed to appear to be weighed. Notable among those that were weighed were the three White carriages, with the condensers in front; Lewis Nixon's little U. S. Long Distance with the body removed, Percy Owen's Winton touring car with one seat removed and gears increased, the Rochet-Schneider, driven by Ernest Cuenod, who in the same car won a blue ribbon in the Long Island endurance

contest and the prize cup for best time in the Roslyn Hill hill-climbing contest; the Benz six-passenger 10-h.p. machine, entered by E. Clarence Jones; the big new Locomobile touring carriage, with box front, finished in red; Jefferson Seligman's 12 h.-p.



Scene at the Start

Mors, with tonneau seats removed; the Haynes-Apperson surrey, the big six-passenger gasoline surrey built by R. W. Coffee & Sons, of Richmond, Va.; also three Ward-Leonard Knickerbockers, three Prescott steamers, three Fournier-Searchmonts, three Locomobiles with air-cooled motors, the Pierce motorette, three Victor steam carriages, four big red Packard touring cars, the Georges-Richard, entered by C. J. Field; Jefferson Seligman's big white Daimler-Mercedes, two Peerless carriages, one driven by C. J. Wridgway; a 12-h.p.

Gasmobile, entered by H. C. Cryder, and three Darracqs, entered by A. H. Tatum, C. D. Cooke and F. A. La Roche.

Completion of Preparations

The weather of Friday was all that could be desired, bright and sunny, with a fresh S.W. breeze all day, making the temperature very pleasant. The rendezvous was set for 7 a. m. and shortly after that hour a few cars turned from Sixth Ave. into Fifty-eighth St. and took up their places along the south curb. Groups of spectators gathered about the Plaza, and many motorists were present to examine the cars before the start. The observers were ordered to be ready at 8 o'clock in the basement of the club building, and shortly after that hour the room was well filled. The applicants for seats included club members, newspaper men, and motorists from distant cities. When all were assembled Mr. Scarritt made a short address, cautioning them to observe the speed regulations under all circumstances and as far as possible to guard against accidents from timid horses and similar causes. The names were then called off, in alphabetical order, each man stepping up to a table and drawing from a pile a celluloid button about three inches in diameter, lettered "Observer 20," etc. On receiving his official score book he was expected to look up his car at once. By 8:30 this ceremony was concluded and all had joined the busy throng outside.

FULL LIST OF STARTERS IN ENDURANCE TEST

No.	Name.	Maker.	Entrant.	Driver.	Motive Power.	Horse Power.	Weight, Complete.
A 2	Packard	Ohio Automobile Co.	Adams & McMurtry Co.	U. S. Ions	Gasoline	12	2,100
A 3	Packard	Ohio Automobile Co.	Adams & McMurtry Co.	F. C. Marsh	Gasoline	16	2,100
B 5	Grout	Grout Brothers	Grout Brothers	C. D. Grout	Steam	4½	1,000
B 6	Prescott	Prescott Automobile Co.	H. M. Wells	W. H. Wells	Steam	4½	1,300
B 7	Prescott	Prescott Automobile Co.	H. M. Wells	H. M. Wells	Steam	4½	1,300
A 8	Mors	Mors & Co.	Wm. N. Beach	W. N. Beach	Gasoline	16	2,200
A 12	Pierce	Geo. N. Pierce Co.	Percy P. Pierce		Gasoline	2½	700
A 14	Daimler	Constaat-Daimler Co.	Jefferson Seligman		Gasoline	12	1,700
B 17	Grout	Grout Bros.	Grout Brothers	J. W. Gould	Steam	6½	1,300
A 18	Benz	Benz & Co.	E. Clarence Jones		Gasoline	10	2,000
A 19			C. E. Miller		Gasoline	12	3,000
A 20	Packard	Ohio Automobile Co.	Osborne W. Bright		Gasoline	12	2,200
B 21	Prescott	Prescott Automobile Co.	F. E. Magee	F. E. Magee	Steam	4½	1,300
B 22	Lane	Lane Motor Vehicle Co.	Lane Motor Vehicle Co.	James Rossa	Steam	10	1,650
A 23	U. S. Long Distance	U. S. Long Distance Co.	A. J. Lamme	A. J. Lamme	Gasoline	7	1,200
A 24	Knickerbocker	Ward-Leonard Electric Co.	Ward-Leonard Electric Co.	A. Emory	Gasoline	5	1,000
A 25	Knickerbocker	Ward-Leonard Electric Co.	Ward-Leonard Electric Co.		Gasoline	5	1,000
A 26	Knickerbocker	Ward-Leonard Electric Co.	Ward-Leonard Electric Co.		Gasoline	5	1,050
A 27	Darracq	A. Darracq & Co.	J. D. Cooke		Gasoline	9	1,250
A 28	Darracq	A. Darracq & Co.	F. A. La Roche	Lloyd Getchell	Gasoline	9	1,250
B 29	Locomobile	Locomobile Co. of America	Locomobile Co. of America	R. S. Davis	Steam	3½	985
B 30	Locomobile	Locomobile Co. of America	Locomobile Co. of America	Murry Page	Steam	3½	1,250
B 31	Locomobile	Locomobile Co. of America	Locomobile Co. of America		Steam	6	1,750
A 32	Packard	Ohio Automobile Co.	H. W. Whipple	H. W. Whipple	Gasoline	12	2,200
A 33	Mors	Mors & Co.	Jefferson Seligman	J. Raditon	Gasoline	12	2,000
A 34	Haynes-Apperson	Haynes-Apperson Co.	H. S. Chapin		Gasoline	9	2,000
A 35	Haynes-Apperson	Haynes-Apperson Co.	H. S. Chapin		Gasoline	6	1,250
A 36	Peerless	Peerless Mfg. Co.	Peerless Mfg. Co.	C. J. Wridgway	Gasoline	16	1,700
A 37	Peerless	Peerless Mfg. Co.	Peerless Mfg. Co.		Gasoline	16	1,700
A 38	Georges-Richard	Georges-Richard	C. J. Field	C. J. Field	Gasoline	12	1,200
A 39	Georges-Richard	Georges-Richard	Alexander Fischer	W. J. Hart	Gasoline	7	1,400
A 41	U. S. Long Distance	U. S. Long Distance Co.	I. W. England	I. W. England	Gasoline	12	1,200
A 43	Autocar	Autocar Co.	Wm. Morgan	W. C. Evans	Gasoline	8½	1,200
C 46	Columbia	Electric Vehicle Co.	Electric Vehicle Co.		Electric		2,000
A 47	Panhard	Panhard & Levassor	George Arents, Jr.	George Arents	Gasoline	12	2,600
A 48	Desboron	Desboron Motor Car Co.	David S. Brown, Jr.		Gasoline	8	2,800
A 49	Gasmobile	Automobile Co. of America	J. Henry Yockel	J. Henry Yockel	Gasoline	12	2,800
A 50	De Dion-Bouton	De Dion-Bouton Motorette Co.	Julius F. Hovestadt	J. F. Hovestadt	Gasoline	8	2,500
A 52	Fournier-Searchmont	Fournier-Searchmont Motor Co.	E. B. Gallaher	E. B. Gallaher	Gasoline	4½	1,900
A 53	Fournier-Searchmont	Fournier-Searchmont Motor Co.	E. B. Gallaher	J. S. Bunting	Gasoline	8	2,500
A 54	Gasmobile	Automobile Co. of America	Henry C. Cryder	W. H. Owen	Gasoline	12	2,500
A 55	Gasmobile	Automobile Co. of America	Haynes-Apperson Co.	Frank Nutt	Gasoline	9	1,950
A 56	Haynes-Apperson	Haynes-Apperson Co.	Knox Automobile Co.	F. H. Fowler	Gasoline	6	1,400
A 58	Knoxmobile	Knox Automobile Co.	Knox Automobile Co.	H. A. Knox	Gasoline	6	1,400
A 59	Knoxmobile	Knox Automobile Co.	Knox Automobile Co.	J. H. Jones	Gasoline	6	1,400
A 60	Knoxmobile	Knox Automobile Co.	Knox Automobile Co.	A. H. Tatum	Gasoline	9	1,300
A 62	Darracq	A. Darracq & Co.	Paul H. Deming	C. H. Deming	Steam	6	1,400
B 64	White	White Sewing Machine Co.	Windsor T. White	W. T. White	Steam	6	1,400
B 65	White	White Sewing Machine Co.	Morris R. Hughes	M. R. Hughes	Steam	6	1,400
B 66	White	White Sewing Machine Co.	Overman Automobile Co.	E. E. DeGowin	Steam	4½	1,500
B 67	Victor	Overman Automobile Co.	Overman Automobile Co.		Steam	4½	1,500
B 68	Victor	Overman Automobile Co.	Overman Automobile Co.		Steam	6	1,400
A 72	Cottureau	Cottureau & Co.	Central Auto Co.	R. A. Greene	Gasoline	8	2,500
A 73	Fournier-Searchmont	Fournier-Searchmont Co.	R. A. Greene	R. A. Greene	Gasoline	8	2,500
B 75	Locomobile	Locomobile Co. of America	Locomobile Co. of America		Steam	3½	1,250

STARTING THE VEHICLES

Order and Promptness Prevailed at the Plaza—Fifty-Five Cars Sent Away in Sixteen Minutes—Few Unfamiliar Automobiles

The scene at the start was brilliant, though without the spectacular effects of a racing scene. The vehicles were drawn up on both sides of Fifty-eighth St., with the leaders ready to swing into Fifth Ave. when given the word. The local background was bright, the people assembled moved about freely to examine the cars and to make inquiries of participants and officials, and occasionally a detachment of local military troops would follow its band of musicians across the starting point on the way to the more formal Memorial Day celebrations. It was an orderly and pleasant picture.

In securing positions in the starting line the drivers had been permitted to follow the old-fashioned rule of "first come, first

served." The quiet regularity with which this performance was repeated every fifteen or thirty seconds as a vehicle left its place in the line and turned northward, disappointed those spectators who had come to the start under the impression that this was to be a great race with dazzling, dashing get-aways and thrilling turns on two wheels around sharp corners.

Fifty-five of the entrants started, and these were sent away within sixteen minutes, the last, A 41, a U. S. Long Distance, entered and driven by I. W. England, leaving at 9:16. The crowd broke gradually, and the officials, newspaper men, observers who had been so unfortunate as to draw vehicles which did not start, and others interested in automobiles and the contest, drifted into little groups to discuss the day's affair. The test was on and steadily winding its way out of town and toward the pic-

unspotted white were also centers of attraction, being novel as French cars on account of the comparatively low floor coupled with more clearance than is usually afforded by even larger and heavier European vehicles. The scrutinizing observers also discovered many interesting details in their construction, such as a water cooling system composed of series of triple pipes encompassed by radiating ribs or fins extending over the three pipes in each group.

While the Darracq has been known in America for several months, both by use here and by frequent trade journal description, A 27 and A 28, entered by Charles D. Cooke and F. A. La Roche, respectively, were watched carefully both at the start and at the controls and finish, and it can be said, both to their credit and to that of their drivers, that they behaved splendidly throughout the entire contest and elicited no small amount of admiration by the punctual manner in which they appeared at checking points. The Benz car, A 18, was interesting as the only vehicle in the contest and probably in practical use in America which employs belt drive. The other European machines to start were medium power road patterns of the well-known Panhard, Mors and Daimler.

The American Machines

The cars of home manufacture were mainly of the familiar makes, and among these there were practically no new or special patterns built for the contest, the entrants having entered and started regular stock models.

The three White steamers attracted attention both because of the fact that they were the only steam vehicles having water condensers and because they were also the only ones entered in section 1 of Class B, to go the whole course without a stop for fuel or water. The three Knox carriages, A 58, A 59 and A 60, were notable as the only gasoline cars with air-cooled motors. The other American machines included one or more entries of the Packard, gasoline; Toledo, steam; Grout, steam; Prescott, steam; Gasmobile, gasoline; Pierce, gasoline; Coffee, gasoline; Lane, steam; U. S. Long Distance, gasoline; Knickerbocker, gasoline; Locomobile, steam; Haynes-Apperson, gasoline; Peerless, gasoline; Autocar, gasoline; Columbia, electric; Desberon, gasoline; De Dion-Bouton, gasoline; Fournier-Searchmont, gasoline; Automotor gasoline; Victor, steam.

PASSING THE CONTROLS

Village of Mianus Serves as Both First and Second Third-Distance Checking Points—The Cars Well Bunched on Outgoing Trip

The village of Mianus, Conn., being exactly 33 1-3 miles from the starting point, it served as both the first and second controls, the return to it from the 50-mile turning point near Southport making 66 2-3 miles. Through a small public square by the side of Mianus creek and adjoining an old bridge which leads to the foot of a long,



VEHICLES LINED UP READY TO START

served." Those who were earliest at the starting point drew up their vehicles at the head of the double line to be sent away first. There was thus no scramble of officials and entrants to rearrange positions, and when the starter's watch reached ten minutes to nine everything was in good order for sending the vehicles on their way to Southport. All of the observers were seated; all of the cars had been supplied with the officially measured supply of gasoline and the steamers given their officially recorded drink of water, and all necessary instructions had been given and assimilated.

Victor First to Leave

Promptly at nine the starter and his assistant gave the word to and checked off B 68, an Overman steam carriage, its observer jotted the starting time in the record book and slowly and quietly the procession started up Fifth Ave. There was no occasion for hurrah or hurry, and probably

turesque Connecticut country through which the route passed. There had not been a hitch at the start, and the assured good weather and roads augured well for a test which would be notable for the number of blue ribbon winners.

A Few New Cars

The accompanying tables furnish the list of vehicles which started. It is noticeable that there were few cars on the run which are not fairly well known. A few of the machines were strangers, however.

Among the numerous European cars which started the newest to this country was a little 6-h.p. Cottereau voiturette, which excited considerable comment while waiting in Fifty-eighth St., on account of its cleverly designed running gear and body and the careful manner in which the rakish appearance of a big racing or touring car had been reproduced in this little light machine.

Two Georges Richard cars resplendent in

gentle hill, runs the road, and in this square arrangements had been made for the checking of all machines and for the supplying of fuel and water in measured quantities to the steamers.

Close to Schedule Time

The schedule called for a minimum time period of 2h. 15m. between the start and the first control; hence the first vehicle to start, that leaving at nine o'clock, could not reach Mianus before 11:15 without the violation of the speed rules. But on account of the condition of the weather and of the roads the checkers at Mianus expected the first machines along almost as soon as they dared to appear without being liable to disqualification. They were not disappointed, for at precisely 11:15 A 53, a Fournier-Searchmont, was espied rolling down the gentle grade into town. It swung around the corner sign board and ran past the control at about the regulation 3-mile gait for towns, and was hardly lost to sight past the bridge and up the hill when little A 28, one of the Darracqs, ran past and on toward the 50-mile turning point.

Then they came in bunches, and those who were checking officially and unofficially formed an exceedingly busy group with its eyes both on the road and the time-record-

ing clock. B 67, a Victor steam carriage, was third at Mianus, and as it drew up in the charging enclosure, the officials there began a half hour of strenuous life in their endeavor to serve all of the vehicles well and at the same time to keep a faithful rec-



Entering Mianus—Outgoing

ord of the time spent and the amount of fuel and water taken on board.

Persistent Late Arrival

The majority of the vehicles were well grouped passing through Mianus on the way out. They came singly and in bunches, but steadily, until 11:30, when their appearance became less regular, denoting that the

tail-enders were beginning to straggle. By noon all but two of the 50 machines which passed Mianus had come and gone. A 12 appeared at 12:20, and those at the control started, in details, to the village hostelry for lunch, thinking that the six which had not appeared would in all likelihood not do so. But at 1:02 a merry sputter was heard around the corner and dusty A 72 drew up, a surprise and unexpected, but ready to continue the run and if possible make up most of the lost time. Brand new, the little Cottreau car had been taken almost directly from the Custom House to the test and its unlimbered motor had become overheated, causing a delay by the roadside to allow it to cool. After passing Mianus, however, it ran steadily and smoothly and finished fairly well, although late.

Coming Back

The first machines were as prompt in reaching Mianus on the home course as on the outgoing, for promptly at 1:30, the time before which none could pass, A 28 and A 27, the carefully timed and driven Darracqs, passed the control and swept around the curve into the finishing third stretch. The vehicles came as rapidly by Mianus this time as before, but the bunched crowd did not cover as many vehicles as on the way out, the participants having broken up and stretched out over greater road distance during the trip to and from Southport. At 2:10, however, all but 13 of the 50 vehicles then on the course had passed. THE AUTOMOBILE AND MOTOR REVIEW checking at Mianus was not continued after this.

MANY VIEW THE FINISH

Street Lined With Spectators Looking for First Car to Arrive—Two Darracqs Claim the Honor—Taking Final Consumption Measures

The scene at the finish was more composite, but hardly more lively, than that at the start. A much greater gathering of people lined the streets and the roped arena into which the vehicles were to run after passing the red flag which marked the end.



Tatum's Darracq Weighing In

Being in the afternoon more carriages claimed streetway and more policemen busied themselves in preserving order. But the spectators did not move about as freely

TIMES AT, START, CONTROLS AND FINISH AND ELAPSED TIMES

Number.	Start.	First control (33 1-3 m.)	Second control (66 2-3 m.)	Finish.	Elapsed Time.	Penalized Stops.*
B 68.....	9.00.00	11.24	.....	.....	.....	.....
B 31.....	9.00.15	.....	.....	.....	.....	.....
B 29.....	9.00.30	11.16	.....	4.16.00	7.15.30	0
B 67.....	9.00.45	11.16	1.40	3.56.30	6.55.45	0
B 75.....	9.01.00	11.18	1.56	.....	.....	.....
B 30.....	9.01.30	11.18	1.40	4.02.30	7.01.00	0
A 62.....	9.01.45	11.18	1.56	4.18.30	7.16.45	2
A 53.....	9.02.00	11.18	1.41	3.56.30	6.54.30	0
A 28.....	9.02.30	11.16	1.30	3.46.00	6.43.30	0
A 27.....	9.02.45	11.16	1.31	3.46.15	6.43.30	0
A 45.....	9.03.00	11.20	.....	.....	.....	.....
A 50.....	9.03.15	11.25	1.52	4.07.00	7.03.45	0
A 53.....	9.03.30	11.15	1.43	3.59.30	6.56.00	0
A 47.....	9.03.45	11.32	2.02	4.13.00	7.09.15	1
A 73.....	9.04.00	11.18	1.49	3.58.00	6.54.00	0
A 2.....	9.04.30	11.18	1.38	3.53.30	6.49.00	1
A 3.....	9.04.45	11.18	1.49	4.43.30	7.38.45	3
A 32.....	9.05.00	11.19	1.49	3.50.30	6.45.30	1
A 20.....	9.05.30	.....	.....	.....	.....	.....
B 22.....	9.05.45	11.21	.....	4.50.00	7.44.15	0
B 7.....	9.06.00	11.21	1.48	4.04.00	6.58.00	0
B 6.....	9.06.00	11.21	1.48	4.04.00	6.58.00	0
B 21.....	9.06.15	11.21	2.03	4.34.45	7.28.30	4
A 24.....	9.06.30	11.27	.....	4.10.00	7.03.30	1
B 5.....	9.06.45	11.16	1.40	4.15.00	7.18.15	0
A 26.....	9.07.00	11.24	.....	.....	.....	.....
A 12.....	9.07.30	12.20	.....	.....	.....	.....
B 17.....	9.07.45	11.17	1.39	5.17.00	8.09.15	1
A 49.....	9.08.00	12.00	.....	.....	.....	.....
B 64.....	9.08.15	11.39	1.56	4.19.00	7.10.45	0
A 23.....	9.08.30	11.27	1.53	4.01.30	6.53.00	0
B 65.....	9.08.45	11.43	2.10	4.27.15	7.18.30	0
A 59.....	9.09.00	11.24	1.41	3.51.00	6.42.00	0
B 66.....	9.09.15	11.27	1.42	3.57.00	6.47.45	0
A 58.....	9.09.45	11.25	1.41	3.57.30	6.47.45	0
A 19.....	9.10.00	.....	.....	.....	.....	.....
A 60.....	9.10.15	11.25	1.41	3.51.15	6.41.00	0
A 38.....	9.10.30	11.29	1.52	3.58.30	6.44.00	0
A 35.....	9.10.45	11.29	.....	.....	.....	.....
A 39.....	9.11.00	11.29	1.47	3.51.30	6.40.30	1
A 56.....	9.11.15	11.27	1.59	4.23.00	7.11.45	0
A 34.....	9.11.30	11.25	1.51	.....	.....	.....
A 14.....	9.11.45	.....	.....	.....	.....	.....
A 18.....	9.12.00	11.39	.....	.....	.....	.....
A 33.....	9.12.15	11.25	1.44	3.53.00	6.40.45	0
A 54.....	9.12.30	11.29	.....	.....	.....	.....
A 36.....	9.12.45	11.40	1.56	4.18.00	7.05.15	2
A 37.....	9.13.00	11.29	1.56	.....	.....	.....
A 43.....	9.13.30	11.27	1.43	4.00.00	6.46.30	0
A 25.....	9.13.45	11.29	.....	.....	.....	.....
A 8.....	9.14.00	11.48	1.50	4.12.30	6.58.30	3
C 46.....	9.14.30	11.42	.....	.....	.....	.....
A 55.....	9.14.45	11.28	1.45	4.28.45	7.14.00	2
A 72.....	9.15.00	01.02	.....	.....	.....	.....
A 41.....	9.16.00	11.45	.....	5.13.00	7.57.00	2

*Steam machines in section 2 of class B were allowed two stops to take on gasoline and water; hence such stops are not marked against them in the above column of stops. The only steam machines entered in section 1 of class B, to go through the 100 miles without stopping to take on gasoline or water, were B 64, B 65 and B 66, which made the run without a stop whatever.

as in the morning, and until the vehicles began to arrive there was not the element of color in the scene that prevailed at the start before the two lines of automobiles had been broken up and sent on the run.



A Late Arrival at Mianus

There was more of the air of a grandstand assemblage awaiting expectantly for the proverbial winner, without whom the American public cannot endure, even though it hears on every side that a test may not be a race and that the vehicles it has assembled to see have been running under a speed limit in accordance with that of the city and state for ordinary driving.

The First Cars Home

At 3:46 the desire to see the first machine to cover the course was gratified, and, true to the driver's intention to make the run without a stop and as close to schedule time as possible, A 28 and A 27 passed the timers and swung around into the Sixtieth St. enclosure, just 15 sec. apart and just 3 min. later than the earliest time at which they could appear. The vehicles had not strung out much since leaving Mianus on the way back, and the first 30 came in within about the same time that elapsed while they were passing the second control. Then their appearance began to drag, and at 5:17 there were still 11 vehicles which had passed the controls, but which had not yet finished. THE AUTOMOBILE AND MOTOR REVIEW checking was not extended further than this.

To one directly interested in automobiles



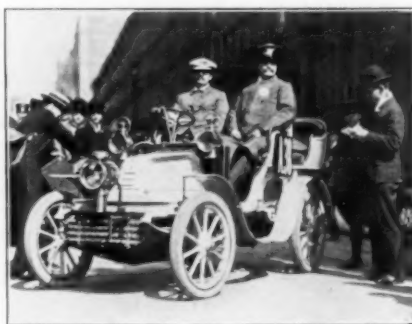
The Benz Carriage

and automobile tests, the occurrences in the side street after the finish were more profitable than the watching of the finishes themselves. Without calculating the elapsing time between start and finish, considering

the number of penalizing stops, if any, the time at which controls were passed and the numerous other details of the record of the run, no definite idea of comparative ability of the machines could be gained by noting the exact time at which they finished.

Interesting Culmination

But in the side street the drivers and observers were narrating their experiences; and the officials were filling the water and gasoline tanks and making careful records of the amount consumed between Mianus and the finish or on the whole run, according to whether the machine had been in the through-run or two-stop class. Here was interesting and valuable information—not in classified and official form for general distribution, but at hand to be picked up in bits and assimilated accordingly. Here also was good feeling and congratulations; satisfaction expressed in facial lines and in words. Most of those who drew up their vehicles for the final reckoning had succeeded in meeting their expectations; the manner in which the test had been managed had prevented confusion, and there were



Starting a Georges-Richard

few regrets. The tales of trouble were still on the road borne in the breasts of more or less anxious drivers and observers who would finish too late to join the general rejoicing of those who had brought their machines through close to schedule time and apparently without having given cause for disqualification or even for preventing the award of blue ribbon certificates.

ON THE ROAD TO SOUTHPORT

The Trip on a Fournier-Searchmont as Told by an Observer—How One Vehicle Made the One Hundred Miles Without a Stop

The instructions to the observers savored somewhat of the proverbial "collar and a pair of spurs," calling for only a mackintosh and a watch; fortunately, however, no one limited himself literally to this costume. No small part of the day's sport lay in the drawing of a car, so much depending upon the chance of a lucky number. After securing a button and a book each man turned at once to the entry list to find out where he was berthed for the day. The writer was fortunate in drawing one of the three Fournier-Searchmonts, a handsome car with an 8-h.p. two-cylinder motor and a comfortable front seat, the tonneau body being removed and a luggage

basket lashed in its place. The car was soon found, close to Fifth Ave., and after mutual introductions between driver and



Seligman's Daimler

observer, both took their seats a little before the formal start at 9 o'clock.

Getting Out of Town

Falling into place as the preceding cars moved on, the start was made at 9:04 some ten cars being already under way. The run up Fifth Ave. in the fresh air and bright morning sun was pleasant enough, except for the crowded condition of the street. Near Seventy-fifth St. a large troop of artillery horses bound uptown filled nearly the whole width of the roadway, with several big artillery wagons going in the same direction, and some contractors' trucks moving downtown. It took some clever steering to avoid a stop in this jam, the drivers of the horses caring nothing for the vehicles. When on Seventh Ave. a close inspection of the watch and the road map showed that though seemingly running very slowly, the whole line of cars was moving at over 8 miles, and our car slowed down before crossing the Harlem. On Jerome Ave. the speed was increased a little, bringing us up with a four-in-hand, which held the left of the road and made no effort to give room for passing. The bad grade crossing near Pelham Bay was passed in safety, and when the car tracks at Bartow



First into Mianus—Home Trip

were reached, 13.86 miles from the start, the watch showed 56 minutes. This was certainly over 8 miles per hour, as called for on a good part of the course, but the car had been run at a safe speed, within the full control of the driver, and a number of other cars had passed us.

From Bartow on the road was charming, winding through a pleasant country, with changes of grade and direction to vary the monotony and showing many beautiful glimpses of Long Island Sound. The roads were all good, mainly macadam, with some stretches of brick in the towns. The hills were easily negotiable on the low gear, and except for the chance of some outright breakdown the only difficulty was in keeping down the speed. The limits of every town were marked by a green flag on approaching, and a white one on leaving—on the outward trip—the limit between these flags being 8 miles, while in the open country it varied between 20 and 15 miles, the lower limit being in Connecticut. Watch and book were worked together, and the car was slowed down at times, others passing us, but it was just on the limit of 2h. 15m. when, in company with several others, we came to the control at Mianus.

The second stage of the journey carried us through two large cities, Stamford and Norwalk, but the open country beyond the

for this little spurt speed was slackened by Norwalk and Darien. A miscalculation of



Entering Mianus—Home Trip

ORDER OF THE RUN

Start.	First Control.	Second Control.	Finish.
B 68	A 53	A 28	A 28
B 31	A 28	A 27	A 27
B 29	B 67	A 32	A 32
B 67	A 27	A 2	A 59
B 75	A 29	B 17	A 60
B 30	B 5	B 30	A 39
A 62	B 17	B 5	A 33
A 52	B 75	B 67	A 2
A 28	B 30	A 59	A 52
A 27	A 62	A 58	B 67
A 48	A 73	A 60	B 66
A 50	A 52	A 52	A 58
A 53	A 3	A 66	A 73
A 47	A 2	A 43	A 38
A 73	B 32	A 53	A 53
A 2	A 48	A 37	A 43
A 3	B 7	A 55	A 23
A 32	B 6	A 39	B 30
A 20	B 21	B 7	B 6
A 22	B 22	B 0	B 7
B 7	B 68	B 3	A 50
B 6	A 59	A 73	A 24
B 21	A 26	B 20	A 8
A 24	A 58	A 9	A 47
B 5	A 50	A 34	B 5
A 26	A 34	A 38	B 29
A 12	A 60	A 50	A 36
A 17	A 33	A 23	A 62
A 49	B 66	B 75	B 64
A 64	A 23	A 37	A 56
A 23	A 43	B 64	A 14
A 65	A 24	A 62	B 65
A 59	A 56	A 36	A 55
A 66	A 55	A 56	B 21
A 58	A 38	A 47	A 3
A 19	A 39	B 21	B 22
A 60	A 35	B 65	A 41
A 38	A 54	.....	B 17
A 35	A 25	.....	.....
A 39	A 37	.....	.....
A 50	A 47	.....	.....
A 34	A 18	.....	.....
A 14	B 64	.....	.....
A 18	A 36	.....	.....
A 53	C 46	.....	.....
A 54	B 65	.....	.....
A 36	A 43	.....	.....
A 37	A 8	.....	.....
A 43	A 49	.....	.....
A 25	A 12	.....	.....
A 8	A 72	.....	.....
C 46	.....	.....	.....
A 55	.....	.....	.....
A 72	.....	.....	.....
A 41	.....	.....	.....

Prescott Steamer Finishing



Finishing the Run

The only difficulty on the way out had been to keep within the time limit, and though a little behind time at the turn, there was ample time for the run in. For the first five miles the car was run at the highest speed of the day, mostly on down grades and with clear roads. To make up

times in working the course in reverse order threw us behind our schedule at the Mianus control, where we were timed at 1:49. The run in was made easily, with no attempt at speeding, and we were timed at the finish about 15 minutes after the minimum limit. The ride was in all ways a pleasant one, lacking alike in incident and accident; the speed was lower than comfort, safety or due regard to others would have called for on a private run. The car did its work in such a way as to indicate ample ability to comply with a much more severe test.

THE TRIP ON A GASMOBILE

Alternating Troubles and Pleasures—Time Wasted
Loosing the Road—Run Interesting and
Replete with Profitable Incidents

A 49. J. H. Yockel's big Gasmobile four-passenger surrey, with rumble seat behind, started at 9:08, with Mr. Yockel driving, and with two of his children and Mr. Smith as passengers, and the representative of



The New Cottereau Car

THE AUTOMOBILE AND MOTOR REVIEW as the observer. On the first grade on Fifth Ave. Mr. Yockel announced that his gasoline valve was too far open, he having opened it slightly just before the start, and that the mixing valve was taking too much gasoline for the greatest efficiency of the motor. The valve could have been given a slight turn from the rear seat without stopping the vehicle, but Mr. Yockel understood this to be against the rules and would not permit it.

With the exception of diminished power all went well for about 12 miles, the vehicle holding its own with the other machines ahead and behind. Then one of the motor's three cylinders went out of action and the first stop had to be made at 10:15. The plugs were all removed and examined, but showed no defect except that the one in the dead cylinder was heavily coated with oil and carbon. Thinking that the battery might have given out, Mr. Yockel connected up a reserve set of cells and started the motor again, but still only two cylinders would work, so a new plug was placed in the dead cylinder. Then she ran all right, and we were off again at 10:26. During the stop the gasoline valve had been



W. T. White and White Steamer

shut off enough so that the motor worked with increased efficiency thereafter and the big Gasmobile took the grades a little better.

Helping an Unfortunate

At Rye the Cottureau (A 72) stopped through the heating of the cylinders, the machine being entirely new and untried, and, since the observer on that car was at the head of THE AUTOMOBILE AND MOTOR REVIEW force, we courteously halted also, and incidentally examined our own ignition, cleaned one of the spark plugs, and changed them in their respective cylinders, after which no more trouble was experienced with the sparking during the rest of the run. Although the motor was working better than at first, all the grades above 5 and 6 per cent. had to be taken on the low gear, which was tedious, especially on the long hills. The car has but two forward speed gears, and the low one is very slow, though it gives ample power, so much, in fact, that the heavy machine had no difficulty in ascending the steep and rough hill at the south end of the bridge in Mianus, where a number of the spectators voluntarily im-

down a steep and rough dirt road. Kind spectators called attention to the error and a difficult turn was made. But in descend-



A Stripped Mors

ing the rough right-hand fork, the machine broke the driving chain on the right side and this necessitated stop No. 3. While a new link was being put in, which required



Two of the Packards

parted the agreeable information that a number of machines had had to give up there.

The control at Mianus was passed with flying colors—it was down grade there—and a fair prospect of making up for the time lost on account of the defective ignition. The Yockel Gasmobile was the 49th vehicle to pass the control on the outward trip. On the return journey it had climbed to 29th position, owing to its own improved running and to the misfortunes of other contestants. The hills at Stamford were comparatively easy.

Just beyond Westport the two Darracqs (A 28 and 27) passed us inward bound at 12:50. They were swinging along at a nice even pace, and were heading the return procession with a considerable lead. The Packard (A 32) was next, and then in rapid succession came A 59, 58, 60, 67, 3 and B 66.

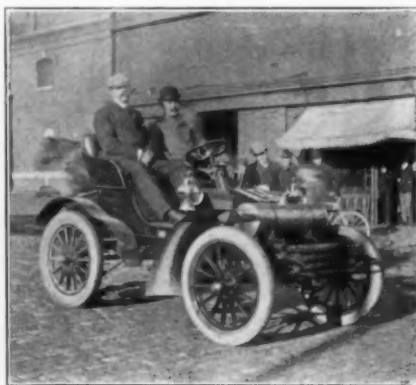
On the Wrong Road

Through the oversight to post an arrow at a fork in the road near the east end of Westport, we took a well traveled macadam drive that circled upward around the brow of a hill instead of the right-hand fork



Fournier-Searchmont Finishing

only about six minutes at the experienced hands of Mr. Yockel, who is an expert machinist, a whole cavalcade of returning pilgrims passed at about the maximum speed



Cryder's Gasmobile

limit. Their order was as follows: A 30, 53, 33, B 5 and 17; A 52, 43, 2, 39, 73, 8, 50, B 29, A 55, 38, 37, 47, 24, 36, B 64, A 62, B 75, A 18, 56, B 7, B 6, B 21, and B 65.

Just before reaching the turning point at Southport we passed B 22, B 68 and A 41, and then C 46, the Columbia electric, on its way back. After making the turn at about 2 o'clock and heading homeward ourselves, in succession the Haynes-Apperson carriage, the Pierce motorette and the Cottureau passed us outward bound. In Westport the Benz and the Haynes-Apperson surrey were out of commission, the latter because of a broken chain on the circulating pump, it was said. For the sake of sociability, we joined them long enough to run a loose drive chain on the left side back on to the rear sprocket.

The Home Stretch

Near Mianus Mr. Yockel accommodatingly granted the request of a Mr. Neuman, an official observer, whose car had failed to put in an appearance at the start, but who had taken a train for the control and wanted a ride back. This gave the machine a heavy load of six persons, which was more than any other machine carried in the contest.

Somehow, in hurrying home through New Rochelle, the sharp turn to the left at Cen-



Locomobile Finishing

tre Ave. was missed. This threw us off the course, which was not struck again until we reached Jerome Ave. That others also got off the course in the same way was evident when we passed a Knoxmobile and a De Dion-Bouton motorette intermediate of these two points, the former out of gasoline.

The Gasmobile reported at the finish at 5:55—just 27 min. outside of the minimum limit, and the five stops made had consumed just 28 min. Mr. Yockel was the 40th contestant to report at the finish.

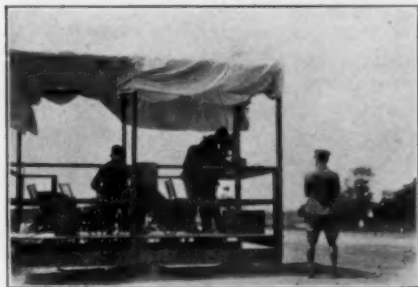
OFFICIAL AND UNOFFICIAL TABLES

The accompanying tables of starting, finishing and elapsed times, order of passing checking points, etc., were unofficially made by representatives of THE AUTOMOBILE AND MOTOR REVIEW. The official tables of the Automobile Club of America were not ready at the time of going to press, hence no definite announcements concerning the award of certificates, disqualifications, if any, duration of stops and their causes and fuel consumption can be given until the next issue.

Saturday's Speed Trials

A most deplorable accident, in which one spectator was instantly killed and four or five others seriously injured, at least one of them fatally, brought to an untimely end the speed trials of the Automobile Club of America on Staten Island last Saturday. The accident occurred at about 1 o'clock, after 16 different machines had made 24 attempts to lower the kilometer and the mile records, and while the mysterious Baker electric torpedo, on which the attention of all was concentrated, was making its first trial. Just after passing the kilometer timing stand and the three-quarters post, and while going at the rate of a mile or more a minute, the machine began a series of increasing sinuous swerves and immediately after crossing the Midland Beach street car tracks the rear driving wheel on the right side collapsed and it made a big swoop toward the right, then semi-circled suddenly and sharply to the left. It plunged into the line of spectators, two or three deep on that edge of the course, knocking half a dozen down, struck the ditch and slewed completely around until it finally came to rest pointing toward the start.

Policemen and spectators made a rush into the great cloud of yellow dust thrown up and lifted the semi-cigar-shaped cover off the machine, expecting to find the operators killed, but W. C. Baker, who was steering, and C. E. Denzer, the operating electrician, stepped out uninjured. But a spectator, Andrew Featherstone, was pinned down under the rear end of the machine, which had to be pried up with poles to release him. He was removed dead. The injured were hastily removed to the Red Cross emergency hospital tent that had fortunately been erected not more than 10 rods from the scene of the accident. Wounds were dressed and ambulances summoned.



Timing Speed Trials—Start

Examinations showed that, aside from Andrew Featherstone, deputy tax collector of New Brighton, being killed outright, Capt. Thomas Taylor, of the quarantine boat Governor Flower, had sustained a fracture of the left leg and both bones of the right

arm at the elbow, scalp and miscellaneous wounds and possible internal injuries; John T. Bogart, a carpenter of Castleton Corners, had a broken right thigh; Mrs. Louise Johnson, of Rossville, had sustained a fracture of the right leg and thigh; Patrick Kenney, of Clifton, a fracture of the left thigh; and John E. Brick, of New Brighton, cuts on head, bruises on back and possible internal injuries; Mrs. Ellen Hay, of Concord, and Charles O. Bowen, of Clifton, both cut and bruised. All the injured were residents of Staten Island.

The Trials Called Off

The speed trials were promptly called off by the racing committee after the accident. Messrs. Baker and Denzer were placed under arrest and taken to the Stapleton police station on a charge of homicide. Every effort was made by friends to secure their release on bail. Coroner Schaefer issued a warrant for their arrest and sent it to the station, and Mr. Baker's brother-in-law, Mr. White, together with George B. Adams, of the Ohio Automobile Co., and John W. Flagler, arranged with the coroner to give bail for them at \$5,000 each. But when the police were requested to release Messrs. Baker and Denzer they refused, taking the position, under advice of the district attorney, that the prisoners were not in the custody of the coroner and that a magistrate was the only person having authority to order their release. Mr. Baker's friends then started to find a magistrate, but were unsuccessful. Meanwhile, it was found by Dr. J. T. Sprague, sanitary superintendent of Richmond Borough, that Mr. Baker and Mr. Denzer were suffering somewhat from the shock and from bruises and strained muscles, and they were removed to the Smith Infirmary, where they remained for the night.

RECORDS BROKEN AND CREATED

C. H. Metz Places World's Motor Bicycle Mile Record at 1:10 2-5 and S. T. Davis Jr. Makes a Mile in 1:12 in a Locomobile

Two records were broken in the trials that preceded the accident—the world's motor bicycle mile record and the American mile record for steam vehicles. C. H. Metz, on his 3¼-h.p. Orient, covered the mile in 1:10 2-5, reducing by 1 3-5 sec. the record of 1:12 made by Albert Champion at the Vailsburg track. His time for the kilometer was 43 3-5 sec., as against 40 3-5 sec. by M. Williams at Nice. Mr. Metz made the only attempt of the day in the bicycle class. He was the seventh contestant to cover the course.

S. T. Davis, Jr., in a Locomobile of 10-h.p., especially built for record breaking, followed Mr. Metz and covered the meas-

ured mile in 1:12 flat, reducing by 3 sec. the American record made by himself on November 16, 1901, in the Long Island A. C. speed trials on the Ocean Parkway on Long Island. The American record has been claimed at 1:06 by S. T. Griffin, made at the Inter-Ocean tournament in Chicago in September, 1900, on the Washington Park track, but has never been authenticated.

The best time made during the day was in 55 1-5 sec. by the 60-h.p. Mors with which Henry Fournier made the world's record of 51 4-5 at the Long Island trials on November 16, last year. This machine now belongs to E. E. Britton and A. J. Levy, of New York.

New Records for the Winton

Percy Owen, in a 15-h.p. Winton touring car, broke the American mile record for machines weighing between 1,000 and 2,000 lbs. His time Saturday on the second trial was 1:17 3-5, as against the previous rec-



The Fournier Mors Car

ord of 1:53 2-5, made by himself in a Winton on Long Island last November. His time for the kilometer was 52 3-5 sec. The machine used was a standard touring car, on which he had increased the gear and from which he had removed the left seat.

Ernest Cuenod, vice-president of the Automobile Club of Switzerland, in the 16-h.p. Rochet-Schneider with which he won the hill-climbing contest at Roslyn in the Long Island A. C. endurance contest on April 26, as well as getting a blue ribbon, covered the mile last Saturday in 1:22 4-5 on the first trial and in 1:26 4-5 on the second attempt in the class for machines weighing between 1,000 and 2,000 lbs.

In the class for machines weighing less than 1,000 lbs., the Renault entered by L. S. Thompson made the best time, covering the mile on the second trial in 1:35 3-5. The second best time in this class was made by the U. S. Long Distance machine entered by Lewis Nixon. On its second trial this machine did the mile in 1:43 3-5 and the kilometer in 1:03. The entire body had been removed from the vehicle and a seat for only one person substituted for the regular seat. This left the skeleton and the powerful motor entirely exposed, greatly reducing the wind resistance.

The third best time of the day was made by William Guggenheim's 24-h.p. Panhard,

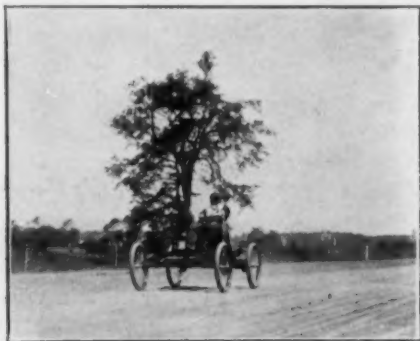
which finished the mile in 1:11 and the kilometer in 44 sec. In this same heavy-weight class (over 2,000 lbs.) E. E. Britton's 16-h.p. Panhard did the mile in 1:36 4-5 and the kilometer in 59 3-5 sec.

The only steam vehicle beside Mr. Davis' Locomobile that made a trial was a 4½-h.p. Prescott, in which H. M. Wells covered the mile in 1:37 1-5 and the kilometer in 1:01 1-5.

H. H. Rogers' machine, the 35-h.p. Daimler-Mercedes formerly owned by W. K. Vanderbilt, Jr., almost stopped in the middle of the course during its trial and took 2 min. 26 sec. to go the mile. Mrs. Howard Gould's 35-h.p. Daimler did even worse, taking 3 min. 18 1-5 sec.

New American Kilometer Records

Although Fred Walsh, who drove the Mors that made the mile in 55 1-5 sec., did not break the record for that distance, he did create an American record of 34 4-5 sec. for the kilometer. G. H. Metz established a motor bicycle world's kilometer record of 43 3-5 sec. S. T. Davis, in the Locomobile, while creating an American kilometer record, did not approach the world's record of



Nixon's Long Distance—Full Speed

29 4-5 sec. made by Serpollet. Percy Owen, in his Winton, also established an American record of 47 sec. for the kilometer for gasoline vehicles between 1,000 and 2,000 lbs. L. S. Thompson's time of 59 sec. for the kilometer, made in the Renault, also establishes an American kilometer record for gasoline machines weighing less than 1,000 lbs. But Jacques Longuez holds the American and world's record for the mile, at 1:27 3-5, made in a De Dion on Long Island last November.

Baker's trial resulted in a world's record of 36 1-5 sec. for the kilometer in the electric class, and undoubtedly would have broken the record of 1:03 for the mile made by A. L. Riker last November, and might also have made the best time of the day for all machines had it not been for the disaster. At the same rate at which it covered the kilometer, it would have finished the mile in 58 1-5 sec.; but Mr. Denzer asserted that at the kilometer stand he turned on more current, so that the rest of the distance would have been traversed at even higher speed—70 miles per hour, he said.

Owing to the unfortunate accident and the cutting short of the programme, many

trials that had been looked forward to expectantly did not come off. Among these were the trials of Albert C. Bostwick's 10-



Metz Breaking Motor Bicycle Record

h.p. Panhard, E. R. Thomas's 40-h.p. Panhard, J. W. Howard's 10-h.p. Howard steamer, and H. H. Rogers, Jr.'s, 35-h.p. Daimler.

The Course and Arrangements

The course for the trials was on the South Shore Boulevard just north of Grant City, on Staten Island. It was a level and nearly straight stretch of roadway, but the hard and traveled part of the road was narrow and not very smooth; moreover, it had a high crown, with a decided slope on each side of the middle. In addition to these defects, there was a slight angle in the course at the three-quarter post which made it impossible to see the whole course from the start, and street car tracks crossed the road midway between the kilometer and mile timing stands. These facts combined to make the high speeds dangerous, both to operators of the vehicles and to spectators, as the bend in the road, and the sloping surface made it difficult to keep the machines in the middle of the course, while the depressions in the surface caused the vehicles to jump about considerably. It is to these conditions that Mr. Baker attributes his disaster. Fortunately, there were not many spectators—probably not more than 3,000 or 4,000—and the police had no difficulty in handling them.

The arrangements on the part of the club were excellent. Official timing stands had



Davis in the New Loco Racer

been erected at the start and finish of the measured mile and at the kilometer point. Telephones and Mors timing instruments had been installed in each of these, and

gongs had been erected at intervals along the course to ring continuously during the time a machine was covering the course, as a warning to spectators to keep off the track. The timing instruments were all electrically connected, so that when a vehicle crossed the wire at the start of the mile all three watches were started, and when it passed the finish those at the beginning and end were stopped. All of the electrical arrangements worked perfectly. The first vehicle was started over the course promptly at 11 o'clock, according to the programme. All machines were required to return to the starting point by another road a block to the east of the boulevard. The course had been roped off for several hundred yards in front of the Boulevard Hotel and on both sides at the finishing point, and the crowds kept outside of them. Everything went off smoothly and satisfactorily up to the time of the Baker trial. Among the spectators were Thomas A. Edison, H. H. Rogers, Jr., son of the President of the Amalgamated Copper Co.; President Shattuck, of the Automobile Club of America; Mrs. W. C. Baker, wife of the president of



The Rochet-Schneider

the Baker Motor Vehicle Co.; Lewis Nixon, Jefferson Seligman, Albert C. Bostwick, William Guggenheim and J. H. Flagler.

Dave H. Morris, chairman of the racing committee, was in the stand at the finish of the course. The timing was done by Charles J. Deiges and John Boyle.

Messrs. Baker and Denzer Exonerated

John Bogart, who had his thigh broken and sustained other injuries, died on Sunday in the Smith Infirmary.

Mr. Baker and Mr. Denzer left the infirmary on Sunday morning and appeared before Magistrate Marsh in Rosebank, where each was admitted to bail in the amount of \$10,000, in addition to the \$5,000 bail fixed by the coroner, and a hearing was fixed for Monday morning. The coroner's jury, after hearing the evidence on Monday, brought in a verdict in the afternoon exonerating Messrs. Baker and Denzer from blame, as follows:

"We, the jurors on this grand indictment, do find that Andrew Featherstone and John T. Bogart came to their deaths by being hit by an automobile on the boulevard in the

town of Southfield, it being an unavoidable accident, and that all precautions were taken by the police in authority to that event, and that we exonerate W. C. Baker



Percy Owen in His Winton

and C. Edward Denzer from all blame."

When Messrs. Baker and Denzer were arraigned before Magistrate Marsh on Monday morning the case was adjourned until Friday.

Coroner Schaefer, after having discharged Messrs. Baker and Denzer, said that he was present when the accident occurred, and that it was unavoidable; that the police had warned the spectators to keep off the east side of the course, the operators of the machines having agreed with the club officials to steer to the left in case of probable accidents.

Regarding the accident, Mr. Baker said he could give no single or exact reason for it; he operated the brakes with his feet and had already pushed the left one when the machine began acting queerly.

Damage Suits Probable

It is thought probable that suits for damages will be brought by the injured persons and relatives of those who were killed against the city of New York, the Automobile Club of America and the Baker Motor Vehicle Co. The trials were authorized by the Board of Aldermen at a meeting more than a month ago, the permit closing the road to traffic from 11 a. m. to 3 p. m. The Automobile Club took every precaution against accidents, giving the police strict instructions to keep spectators off the side of the road on which the accident occurred.



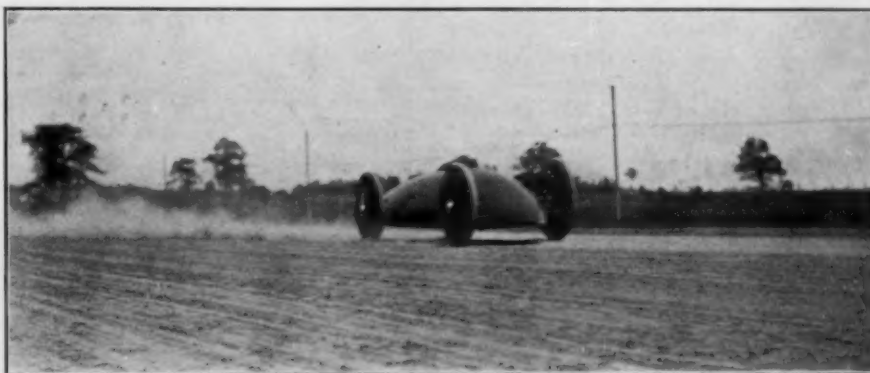
Where the Accident Occurred

Possible suits against the Baker company will hinge on whether it can be shown that the Baker machine was defective in construction or that the operators were incompetent to drive it.

Baker's Ante-Accident Statement

The following statement, prepared by the Baker people and mailed to the trade press before the speed trials, is interesting as showing their absolute confidence that the machine would break the record and, more important still, indicating their belief that mere speed trials are without practical value:

The practical feature of the race affair in which we have made a new world's record is to make the Baker electric more widely known and at the same time center the public attention to the fact that we secured great results from little power. The principle is involved in the manufacture of all Baker electric, and in due time it will be recognized and appreciated, but rather than await the slow process through the regular channels of business, we availed ourselves of the opportunity offered in this speed contest, that we might publicly show in a practical way that our theory of electric automobile construction was based upon principles of applied science in which friction is dealt with and reduced to such a degree that our small power demonstrates



THE BAKER RACING MACHINE 20 SECONDS BEFORE ACCIDENT

results equal to or greater than the larger, cumbersome and more expensive machines.

This really is the whole secret of the fast mile. We care absolutely nothing for records or racing, excepting so far as it serves to demonstrate better design and practical and precise manufacture. The laws of motion are defined, and we have calculated all frictional resistance, and reduced same to the minimum—no new theory with us, but the same line of thought we have always carried out with our regular Baker electric.

The racer, being impractical for daily service, becomes practical to prove the correctness of our regular designs, for, unlimited by any demands for comfort or curbed by regulations as to speed, we simply carry our lines to the extreme to secure abnormal results, or, in other words, we magnify our every-day theory of manufacture in a degree sufficiently important to attract unusual attention.

THE BAKER TORPEDO

A Racing Machine Pure and Simple—Frame and Machinery Strongly Built But Mounted on Light Suspension Wheels

The Baker racing machine, which was the one "dark horse" of the day, and whose performance had been awaited with the keenest interest, was damaged only slightly

by the accident; the right driving wheel was entirely gone, except for the tangled web of twisted wire spokes wound around the hub; the right front wheel had the wood rim broken in half a dozen pieces, and the spokes bent, but the tire still clung to it; several of the gutta percha battery cells had holes broken in their tops and the connections were broken; the semi-cylindrical cover, made of 3/8-in. pine boards, had several holes punched in it; otherwise the machine was intact, even the 5-in. glass covers of the volt and ampere meters being uncracked. When the wheels had given way the flat platform of the machine had simply settled down on the ground, and, as every bit of the machinery was carried above the platform, it, as well as the operators, escaped serious injury.

The machine was built wholly for speed, with the sole object of eclipsing all automobile straightaway records. It had a 12-ft. angle-iron frame suspended below the 2-in. axles from heavy journals. Interposed between the frame and journals at the rear were two flat leaf springs disposed longi-

tudinally, and at the front were springs arranged transversely. The sides of the frame were straight between the wheels and were curved inwardly toward the ends, which were straight across and 30 ins. wide. A light board flat platform was secured to the bottom of the frame and had not more than 6 or 8 ins. clearance from the ground. A 40-volt Elwell-Parker motor was mounted just back of the center of the machine in a strong metal frame. All frame and machinery parts were aluminum painted. Inch Whitney chains connected sprockets at either end of the motor with 12-in. sprockets mounted on either half of the drive axle. To provide flexibility of drive and prevent chain breakages, the large sprockets were provided with a series of coil springs arranged circumferentially between the spokes. A band brake 3 ins. wide and a foot in diameter was connected with each of the large sprockets on the inside, and quarter-inch wire cables extended forward from the band brakes to the brake levers at the front. An incased differential connected the axle ends. A heavy truss casting supported these parts.

Back of the rear axle and carried on the tail end of the platform were 11 cells of

H. Morris, chairman of the racing committee; Jefferson Seligman, Winthrop E. Scarritt, Sidney Ripley, George F. Chamberlin, William H. Hall and J. M. Hill.

After the meeting it was said that a minority of the governors were in favor of placing a ban on track racing as well as speed trials on the road. President Shattuck said that the action of the governors in opposition to speed tests was unanimous. For himself he said: "I have felt very badly about the accident on Saturday—so strongly, in fact, that hereafter I am opposed to automobile races or speed tests of any description."

Promoters Must Be Licensed

Following the meeting of the board of governors, Messrs. Shattuck, Scarritt and Seligman attended the regular monthly



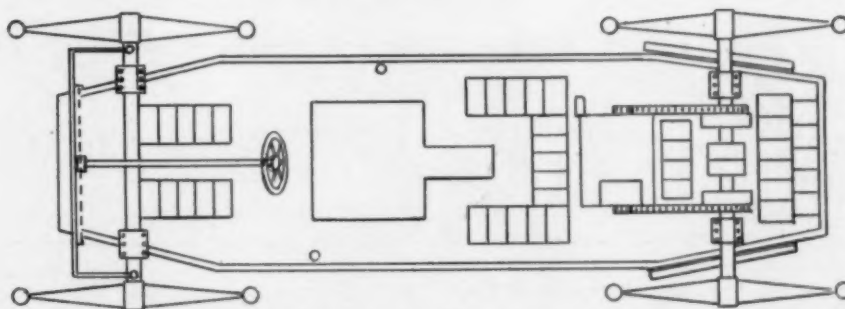
The Wrecked Baker Racer

meeting of the board of directors of the American Automobile Association at the rooms of the Automobile Club of America, on Fifth Ave. Mr. Scarritt, president, presided. A. R. Pardington, of the Long Island A. C., and W. J. Stewart, of the Automobile Club of New Jersey, were also present. No formal action was taken against speed trials, but the board passed a resolution giving to the stewards of all race meets power to refuse to let any machine start in a race if in their judgment there is any reason why it should not start. Under this rule the managers of race meets will be able to exclude any machine which appears to be unsafe.

Granting of Licenses

A resolution was also passed requiring that any organization wishing to promote races must obtain a license from the association before a sanction will be given by the association for a race meet. These licenses will not be granted to any but bona fide clubs or associations devoted to the interests of automobilism. When licenses are issued they must also be approved by the racing committee of the American Automobile Association.

This action was evidently taken as a result of the announcement of a meeting to be held at Brighton Beach on June 21 by the so-



DIAGRAMMATICAL PLAN VIEW OF THE BAKER RACING MACHINE

called National Automobile Racing Association. It was learned after the meeting that a sanction had been refused for these events, for which programmes were issued a week ago.

Following the meeting it was announced that the Long Island A. C. would hold a race meeting on the Brighton Beach track on August 23.

The executive committee of the National Association of Automobile Manufacturers also met on Tuesday afternoon, but no in-

formation would be given out regarding the action taken by those at the meeting.

SPEED TRIAL TABLES

The Automobile Club had not compiled a table of the speed trial results up to Tuesday, and could not promise it for several days. The subjoined table is compiled from the times as announced at the kilometer and mile timing stands by the official timers and caught by THE AUTOMOBILE AND MOTOR REVIEW staff.

TABLE OF RESULTS OF STATEN ISLAND SPEED TRIALS

Class 1—Motor Bicycle.		First Trial.		Second Trial.	
Entrant.	Machine.	H. P.	Mile. Kilom.	Mile. Kilom.	
C. H. Metz, Orient.	3 1/2	1.10%	1.43%	....	....
Class 2—Motor Tricycles—No Entries.					
Class 3—Gasoline Vehicles weighing less than 1,000 lbs.					
L. S. Thompson, Renault.	8	1.54%	1.17	1.35%	.59
H. Ward-Leonard, Knickerbocker.	8	1.42	1.05%	1.45	1.05%
Ward-Leonard Elec. Co., Knickerbocker.	4 1/2	1.55	1.07%	2.03	1.16%
Lewis Nixon, U. S. Long Distance.	7	1.45	1.06%	1.43%	1.03
Class 4—Gasoline Machines weighing between 1,000 and 2,000 lbs.					
Ernest Cuenod, Rochet-Schneider.	16	1.22%	.56%	1.26%	.53%
Jefferson Seligman, Mors.	12	1.33%	.57%	1.32%	.57%
Percy Owen, Winton.	16	1.25	.52%	1.17%	.47
F. A. LaRoche, Darracq.	16	1.44	1.03%	1.40	1.03%
Class 5—Gasoline Machines weighing more than 2,000 lbs.					
H. H. Rogers, Jr., Daimler.	35	2.26%	1.10	....	....
William Guggenheim, Panhard.	24	1.11	.44	....	....
E. E. Britton, Panhard.	16	1.36%	.59%	....	....
Britton & Levy, Mors.	60	.55%	.34%	....	....
Mrs. Howard Gould, Daimler.	35	3.18%	2.03%	....	....
Class 6—Steam Machines.					
H. M. Wells, Prescott.	4 1/2	1.27%	1.01%	....	....
S. T. Davis, Jr., Locomobile.	10	1.12	.46%	....	....
Class 7—Electric Machines.					
W. S. Baker, Baker.	7	....	.36%	....	....

NEW RECORDS AND BEST TIMES SCORED

Class.	Entrant and Vehicle.	Best Time for.	Previous American Record.	Previous European Record.
		Mile. Kilom.	Mile. Kilom.	Mile. Kilom.
Motor bicycle, C. H. Metz, Orient.	1.10% .43%	1.12	1.12%	.40%
Light gasoline, L. S. Thompson, Renault.	1.35% 1.17	1.27%	1.27%	.36%
Medium gasoline, Percy Owen, Winton.	1.17% .47	1.53%	1.10%	.36%
Heavy gasoline, Britton & Levy, Mors.	.55% .34%	.51%	1.09%	.32%
Steam, S. T. Davis, Jr., Locomobile.	1.12 .46%	1.15	....	.20%
Electric, W. S. Baker, Baker.	.36%	1.03	....	....

TABLE OF STRAIGHTAWAY RECORDS TO DATE

Distance.	Time.	MOTOR BICYCLE.	Machine.	Place.	Date.
		Operator.			
One mile, American.	*1.10%	C. H. Metz.	Orient.	Staten Island.	May 31, 1902
One mile, European.	1.12%	M. Williams.	Clement.	Nice, Italy.	....
One kilometer, American.	.43%	C. H. Metz.	Orient.	Staten Island.	May 31, 1902
One kilometer, European.	*.40%	M. Williams.	Clement.	Nice, Italy.	....
GASOLINE—(Under 1,000 lbs.)					
One mile, American.	*1.27%	Jacques Longue.	De Dion.	Long Island.	Nov. 16, 1901
One mile, European.	1.27%	Guillaume.	Darracq.	Nice, Italy.	....
One kilometer, American.	.59	L. S. Thompson.	Renault.	Staten Island.	May 31, 1902
One kilometer, European.	*.35%	Barras.	Darracq.	Nice, Italy.	....
GASOLINE—(Between 1,000 and 2,000 lbs.)					
One mile, American.	1.17%	Percy Owen.	Winton.	Staten Island.	May 31, 1902
One mile, European.	*1.10%	M. Barras.	Darracq.	....	....
One kilometer, American.	.47	Percy Owen.	Winton.	Staten Island.	May 31, 1902
One kilometer, European.	*.36%	Jenatz.	Jenatz.	....	....
GASOLINE—(Over 2,000 lbs.)					
One mile, American.	*.51%	Henri Fournier.	Mors.	Long Island.	Nov. 16, 1901
One mile, European.	1.00%	Degrals.	Mercedes.	Nice, Italy.	....
One kilometer, American.	.34%	Fred Walsh.	Mors.	Staten Island.	May 31, 1902
One kilometer, European.	*.33%	W. K. Vanderbilt, Jr.	Mercedes.	Near Paris.	....
STEAM.					
One mile, American.	*1.12	S. T. Davis, Jr.	Locomobile.	Staten Island.	May 31, 1902
One kilometer, American.	.46%	S. T. Davis, Jr.	Locomobile.	Staten Island.	May 31, 1902
ELECTRIC.					
One kilometer, European.	*.29%	Serpellet.	Serpellet.	Nice, Italy.	....
One mile, American.	*1.03	A. L. Riker.	....	Long Island.	Nov. 16, 1901
One kilometer, American.	*.36%	W. C. Baker.	Baker.	Staten Island.	May 31, 1902

*World's records.

The Gasoline Vehicle

The principle of the internal combustion engine is simplicity itself. A mixture of inflammable vapor and air, in the right proportions for complete combustion without excess of either, is drawn into a cylinder by the out-stroke of the piston, compressed by the return stroke into about one-quarter of its original volume, and exploded by an electric spark. The combustion, by heating the gases, increases their pressure in corresponding degree; and this pressure is then utilized as if it were the pressure of so much steam to drive the piston on its next out-stroke. In the "four-cycle" engine employed in automobiles, but one stroke is a working stroke, the others being devoted to the operations of the exhaust, suction and compression.

The Motor and Its Problems

Eliminating as it does the intermediate stage of heat conversion represented by the steam boiler, this method of propulsion is far more economical of fuel than the steam engine, the ratio being seldom greater than one to three for equal powers, and often less. This is its first advantage, and, where gasoline is the fuel in each case, it is often the leading one. On the other hand, it has certain inherent drawbacks. The correct proportions of gas and air must be closely adhered to under all conditions of speed and load, under penalty of serious loss in efficiency; and when we are dealing with liquid fuel in such minute quantities as are used at one stroke of the piston, this is a problem of no small difficulty. Then the gasoline must be evaporated and thoroughly commingled with the air before it enters the cylinder; and, finally, the electric ignition apparatus must be adequate to its purpose and in perfect order. Besides these, the cylinder walls, heated by the explosions within, must be cooled by water circulating through a jacket around them; and this water, to keep it from boiling away, must usually be pumped through a bank of flanged radiating coils on its way back to the tank; and this means a pump to be kept in order.

The explosion engine, then, is a chemical apparatus first of all, and a motor only after the chemical conditions for combustion have been satisfied. As these conditions are very subtle, and it is seldom possible to tell exactly what is going on inside of the engine, it frequently happens that an engine will run poorly, or fail to run at all, when the cause may be any of half a dozen things, none of which are externally obvious. The gasoline, for example, may be too heavy to vaporize readily; the vaporizer itself may be set to feed too little or too much gasoline; the electric spark may be too weak or it may be grounded or short-

circuited; there may be water in the gasoline; there may be a leak in the valves or piston rings, so that the charge escapes instead of being compressed; or the fuel pipe may be obstructed or the muffler choked. Some of these derangements are purely mechanical, and fall in the same category as steam engine troubles, of which ocular evidence may usually be found by a little hunting. In the ideal case they should all be mechanical, so that a simple inspection should determine whether or not a given part is in working order; and, being in order, it should be possible for it to work in only one way. The ideal is a difficult one, particularly as regards the ignition system and the vaporizer; and were it not that the compression of the charge greatly facilitates its ignition and accelerates its combustion, thus making up in some measure for the shortcomings of igniter and vaporizer, the commercial use of the explosion engine would still be a thing of the future. But, after all, electrical science is three-fourths mechanical, and the remaining fourth, in our case, is easily learned; and both igniters and vaporizers, the best of them, may fairly be called working successes. The igniter needs watching and occasional cleaning and adjustment, and the battery, if one be used, needs renewal or recharging. Of vaporizers, it may be said that their name is Legion; and the worst of them are very bad indeed. The most successful varieties work on the atomizing principle, the stream of air sucked by the piston drawing into itself a little spray of gasoline from a nozzle communicating with a constant level cup. Once set, a good vaporizer needs only to be kept clean, to be fed with a uniform grade of gasoline, and to be let alone.

Need of Speed Changing Gear

A peculiarity of the explosion motor is that it works best with a full charge and at good speed. Consequently, unlike the steam engine, which is most economical at one-half of its full load or less, the explosion motor is supplied with a variable gearing between it and the rear wheels; and by changing the gearing the motor may be made to run at about the same speed, whether the vehicle is spinning freely along a boulevard or laboriously climbing a hill. For intermediate speeds the motor itself may be checked, by a throttle or otherwise; and by a judicious combination of the two methods all possible speeds up to the maximum may be obtained. The greater the number of gear ratios, the higher will be the attainable average of vehicle speed, because the motor itself will always be working at or near its best speed; and the French touring and road racing machines

usually have four such gear changes. This complicates the mechanism somewhat, and the manipulation as well; and three or even two such ratios are often preferred in this country.

There are several ways of effecting the changes of gearing. The gears may be loosely mounted on square shafts, and slid bodily into or out of mesh with each other while turning; and this method, barbarous though it sounds, has been brought to a high point of efficiency by the French. It has the advantage that it involves the meshing of no idle gears, and for multiplied speed changes it adds very little to the weight. Where there are but two gear changes, the gears are usually in constant mesh, and individual clutches put one or the other pair in action. A modified system is that of planetary gearing, with internal and external spur gears connected by pinions, the whole being in a case which revolves as a unit for the high speed. With a fast-running engine, it has the disadvantage that the revolving case acts as a sort of flywheel, necessitating somewhat more powerful brakes to make a quick stop.

Best Car for Touring

Taken altogether, the gasoline vehicle requires for its routine operation more manual processes than the steam vehicle; while to care properly for its adjuncts of vaporizer and ignition apparatus, and to diagnose its ailments from the indirect tokens of sound and feeling, as must often be done, calls for a higher order of intelligence. A gasoline vehicle badly engined or badly managed will, as often as not, refuse to run at all, in which respect it differs widely from the steam vehicle. On the other hand, when properly handled it will take care of itself to a far greater extent. Given fuel, lubricating oil and water, a good gasoline machine will run hour after hour, a hundred or two hundred miles a day, with no more attention than the necessary cleaning, inspection of bearings, and renewal of batteries. Any sort of water will do for it, as there is no boiler to scale and burn out. There is no water level, no feed pump, no "automatic regulator" on fuel or by-pass valve to be watched. Its burner cannot blow back, the fuel is not under pressure, and if the gasoline does leak there is no naked flame to set fire to it. The explosion engine has its faults, and it has the defect of its youth, for it is less generally understood than the steam engine; but its present is bright and its future is still ahead of it, and of those who have mastered its ways there are few who are not its enthusiastic friends.

Entries by owners of fast vehicles in Chicago, Detroit and other cities now seem practically assured for a race meet in connection with the Wisconsin State Fair, to be held near Milwaukee next fall. The events will be held on a mile track, and an effort will be made to have Alexander Winton give a speed trial against time.

The Week's Patents

DIRECT TRANSMISSION

Letters patent No. 700,786, dated May 27.—Albert L. Kull, of Camden, N. J.—To furnish a transmission device whereby at the high speed the drive is directly made from the countershaft to the wheels without any of the intervening speed gears being in operation, Mr. Kull provides a countershaft with a sleeve and an ordinary set of spur forward and reverse drive gears whereby the drive is transmitted to a sleeve upon the shaft, and on which is mounted a driving sprocket.

The shaft also carries a disk inclosed by a housing on the sleeve and to which is secured a split ring adapted to be expanded against the inner periphery of the housing flange. This split ring is controlled by a pair of toggles connected at their outer ends to the respective ends of the split ring and at their inner ends to a link arm that is pivoted crosswise of the shaft disk. The outer end of the arm bears against the inner conical or bevel wall of a tubular extension or annular flange projecting from a grooved collar adapted to engage and be moved by a forked clutch. The latter is connected to the operating lever or handle by suitable means.

It is obvious that movement of the conical flange toward the housing forces the outer end of the toggle arm downward and thus spreads the toggles, expanding the split ring so that it will engage the flange of the housing. The axle and the sleeve are thus locked together, and as this movement is accompanied automatically by the disconnection of both of the brakes on the speed gear the whole group of countershaft and sleeve parts rotate in unison with the speed of the former.

Mr. Kull has also been granted letters patent No. 700,784, dated May 27, which relate to a running gear and vehicle body so arranged that a gasoline motor is rigidly supported upon the running gear frame; while the gasoline tank is placed within the seat back structure and connected to the motor by a flexible pipe.

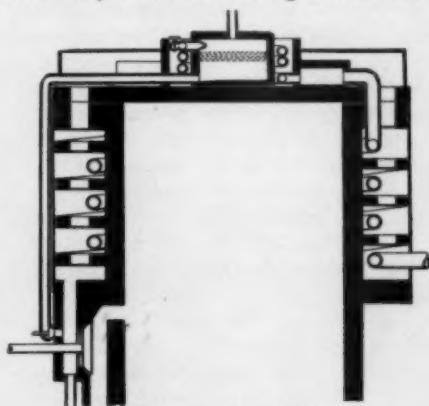
PACKARD OILING DEVICE

Letters patent No. 700,768, dated May 27.—William A. Hatcher and James W. Packard, of Warren, O.; said Hatcher assignor to said Packard.—This invention comprises a device whereby the lubricating system of a hydro-carbon vehicle is shut off when the engine is stopped and turned on when it is started. It operates in connection with the cylinder compression relief valve.

As shown in the accompanying illustration, there is an oil cup on the cylinder, whose valve is connected by a link with the

arm of the compression relief valve. This link extends forward and is also attached to the arm which operates a multiple valve controlling the feed of oil from a common reservoir into a series of gang feed pipes running to various parts of the motor and vehicle.

This oil reservoir comprises a tank with a series of vertical tubes, which open at the bottom into a valve seat, inclosing a long valve with registering cross holes, and which may be turned to bring its holes into



Briggs' Peculiar Motor

line with the oil tubes above and with the corresponding feed pipes below. The oil from the reservoir reaches the feed tubes by means of wicks supported by wires and which carry the oil by capillary attraction upward over the top edge of the tubes to allow it to drip downward inside of them when the multiple valve is open.

Connected with the multiple valve arm by means of a short link is one arm of a rocking bar so located that a handle on its end is within convenient reach of the driver of the vehicle. The relation of the oil cup and tank valves to the compression relief valve is such that, by means of the common actuating medium, the latter is opened when the former are closed, or vice versa, which renders the turning on and off of the oil supply automatic with the starting and stopping of the engine, as the latter is concomitant with the opening and closing of the relief valve.

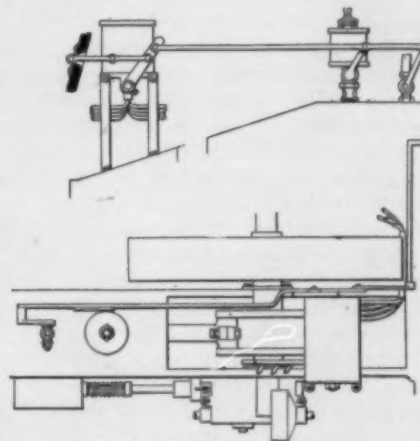
HYDRO-CARBON ENGINE

Letters patent No. 701,140, dated May 27.—Dwight A. Briggs, of Evart, Mich.—This is an engine whose peculiar construction leaves one in doubt as to whether it is a two or four-cycle motor, or both, or so arranged that it can by predeliction on the part of the user become either one or the other. The inventor's chief purpose has evidently been to provide means whereby the vaporization of the fuel can be accomplished mainly by heating and whereby, also, the atmospheric air which is mixed

with the vapor may be heated before reaching the latter. To accomplish this the upper end of the cylinder is formed with a spiral rib, which is encased by a thin jacket and which encompasses a spiral feed pipe. This pipe terminates in a box on the cylinder head, and from which leads a second spiral pipe that winds around a vaporizing chamber and finally, by means of a spraying nozzle, enters this chamber. An air port on top of the vaporizing chamber forms the first entrance for air, while a series of screens tend to break up the charge of fuel which is sprayed into the chamber through the nozzle.

The delivery of the vapor is through a pipe leading from the vaporizing chamber to a port on the side of the cylinder and it is controlled by a small mechanically operated valve. This port also connects from above with the open space between the spiral ribs on the cylinder wall, so that the air taken in from the hood or covering over the cylinder passes through holes in the ribs and mixes with the vapor as the latter enters the port. A tube extending from the bottom of this port obligingly carries any unvaporized oil back to the supply tank. This initial port connects with a second port by means of the ordinary suction operated inlet valve, which, in this case, is backed by a screen to further break up the charge as it enters. The second part connects with the cylinder both above and below the piston, but the patent specifications do not explain in what manner the entrance of the charge is governed or what becomes of that portion of it which enters the crank casing.

No provision is made to prevent overheating of the cylinder, and the inventor evidently does not intend to utilize the heat of the explosions for ignition, as he specifies some suitable form of igniter for the



Packard Automatic Lubrication

interior of the cylinder. For fear that, when starting the motor, his system of pipes, spraying and screening will not vaporize the fuel, a needle valve is attached to the spraying nozzle, so that a little fuel may be dripped into the panlike cylinder head covering and there ignited to supply the initial vaporizing heat.



MARINE MOTOR DEPARTMENT

THE YACHTING SEASON OPENS

Memorial Day Celebrations on Long Island Sound—
Power, Auxiliary and Sailing Sport at
Norwalk, Bridgeport and Hartford

From Larchmont to Cape Cod the yachting season was started with ardor on Memorial Day. Races were held by the Bridgeport and Newport yacht clubs, the Hartford Y. C. opened its clubhouse at Fenwick, at the mouth of the Connecticut, and the station of the New York Y. C. at New London was formally opened. Everywhere there was enthusiasm, though the weather of last Friday was not ideal for water sports. However, from indications already apparent, there is reason to believe that the season of 1902 will be notable from the extent of the popular interest in yachting and the general competition in all classes of pleasure craft, as well as from the large additions to the fleets and the people turning their attention to the water for the first time. The *Motor Review* has during the past winter and spring chronicled the activity in the boatbuilding shops throughout New England, and of all the new boats the class which promises the greater number of accessions is the launch. The many engine and hull builders who have engaged in the business in the last year have been put to their utmost to supply the demand; and, singular as it may seem, not a single failure of a concern engaged in launch building has been chronicled within a year.

The yacht races at Bridgeport and Newport have been reported in the daily press, but the South Norwalk Launch Club had its first outing on Memorial Day, visiting the Norwalk Y. C., where several events were run. The Launch Club members had considerable sport in racing to and from Norwalk, and it was found that the boats of William B. Unholz, David Dickson and William Povez were evenly matched, while the launch belonging to Lester Wheeler outdistanced the fleet. Vice-Commodore Wheeler arranged the day's outing.

The Norwalk Y. C. formally opened the season Friday and throughout the day and evening the clubhouse at Hickory Bluff was filled with guests, the club entertaining the Pine Ledge Club, the South Norwalk Launch Club and the Knob Outing Club. There were scores of launches about the rendezvous all day, and the occasion proved the most successful in the history of the organization. Commodore A. E. Chasmar entertained a large number of guests on board his yacht *Ayli*. A concert was given during the afternoon and dancing was enjoyed during the evening. The handsome

silver cups to be awarded by the flag officers this season were on exhibition in the clubhouse and were much admired.

Yacht or Automobile Clubs?

Preliminary to opening the season on Memorial Day the officers and former officers of the Bridgeport Y. C. had a dinner on Wednesday evening, and the function was successful in every way. Several amusing incidents occurred, one of which is worthy of repetition. Speeches were being made on the beautiful sport of yachting, when it was noticed that at one portion of the table little attention was being paid to the speakers. Former Commodore F. M. Wilson, who presided, looked sternly at the offenders and frowned, but they did not heed him. Dr. C. C. Godfrey was telling of his varied experiences as an automobilist and there were laughter and interruptions from those around him.

The merits of the jump spark, the mechanism of high-speed clutches and the likelihood of cylinders leaking were being discussed with avidity. When it came to the discussion of the merits of the gasoline and steam types of automobiles there was a babble of protest and defiance from followers of both methods. Then the discussion became infectious and down the line the ardent motorists were talking of tires, horse power and French motors.

Finally Commodore Wilson could stand it no longer, and with withering emphasis he turned to the group and said: "Say, boys, is this a yacht club or an automobile club?"

Members of the Bridgeport Y. C. are wrought up over a decidedly unsportsmanlike action on the part of one of the club members, and the act is likely to lead to the discipline of the offender. The action of which complaint is made was the refusal of assistance to a member of the Stamford Y. C. flying a signal of distress from a disabled auxiliary sloop, unless payment of a sum of money was first made. The incident occurred east of the Norwalk Islands on a recent Sunday. A large auxiliary sloop left her winter moorings for E. F. Leeds' shipyard, in Bridgeport, to be fitted out and put in commission. The sloop was depending upon her auxiliary power to reach Bridgeport, and as the trip could be made in a short time under ordinary circumstances, she was not stocked with provisions or water. The weather was extremely bad, but the sloop made good time until the Norwalk Islands were reached, when the check valve gave out and she was left absolutely helpless. With no sails, no

power, no food or water aboard, there was nothing to be done but fly signals of distress. In answer to the signals a large launch owned by a member of the Bridgeport Y. C. approached, and one of her party inquired what was wanted. The predicament was explained and assistance in getting into port was asked. The occupant of the launch refused to give any aid unless \$15 was forthcoming, for towage to Bridgeport. As there was nothing to be done but to pay the amount demanded or stay out on the Sound while night was fast approaching, the money was paid and the sloop towed in.

When the action of the launch owner reached the ears of other members of the club general indignation was expressed and the matter was placed before the regatta committee for consideration.

A NEW FIELD FOR MOTORS

Introduction of the Gasoline Auxiliary in Sailing
Sloops of the Connecticut River Blue-
fishing Fleet and Its Effect

NEW HAVEN, CONN., June 4. (Special Correspondence.)—The gasoline motor fever has struck into the Connecticut River blue-fishing fleet, and before the season opens in August a goodly share of the boats will be equipped with the new invention. This fleet is probably the only one of its kind on the coast. There are perhaps 25 boats in it, 50 men in all, and they are primarily farmers along the lower portion of the river. In the early spring, however, they bend their energies to shad fishing, and work night and day to start a profitable season's work from this source. After this fishery has passed they go on to their farms for a few weeks and get their crops well under way. Then it is time for them to leave the river for Fisher's Island, where they open their blue-fishing season in the Race, making harbor in land-locked Little Hay Harbor, on the west end of the island. To make this voyage they use a long, low-sided jib-and-mainsail boat of a type which is well known as a "Connecticut River Boat." The fishermen follow the blue-fish during the early fall while the season is ripening their crops ashore. The catch is handled on a co-operative basis, and one or two of the vessels carry the united hauls of all back to the river landings every day, a distance of perhaps 30 miles, where the fish are either sold fresh or else laid down in salt pickle. At harvesting time all of the boats return to the river. The custom has come down from the days when shad-fishing was a very important industry on the river. Much money has been made in this way.

It is believed by the fishermen that the gasoline motor will be a first-class auxiliary for their peculiar sloop-rigged fishing boats, and those who are familiar with the work of power launches say that once the innovation has been introduced into the Connecticut River fleet its use will quickly

do away with all form of sail propulsion for the little craft.

Everett B. Webster's Coyote has arrived here, and is moored along side of the wharf of the National Steel & Wire Co., in the Quinnipiac River, Mr. Webster being the treasurer of the company.

She is a handsome boat, designed and built by the Daimler Manufacturing Company, and is 86 feet in length with 4.9 draft. She has a guaranteed speed of 11 miles.

The new government bulletin on ship building shows that there were built during the year 1900 in Connecticut 22 steam launches, valued at \$13,000; 159 power launches, valued at \$56,000; 77 sail boats, valued at \$12,000, and 82 row boats, worth \$3,000. It does not take a very wonderful pair of eyes, consequently, to see what strides the marine motor had taken here year before last. It has been progressing with still greater rapidity ever since.

Marshall D. Stevens, of Guilford, has put

STORMY TRIP OF THE NAUTILUS

The Nautilus, E. H. Cutler's new 47-ft. gasoline launch, reached her moorings at Springfield after a trip from Boston, somewhat the worse for a rough experience. The cruise occupied nearly four days, and rough seas and head winds were encountered all the way. Mr. Cutler, with Dr. F. N. Seerley, a machinist and an engineer, left Boston early Thursday morning, and during the afternoon they lost their bearings. Mr. Cutler thinks they must have gotten 25 miles off their course before they discovered they were on the wrong track. They turned about and headed into a stiff breeze, hoping to bring up somewhere on the Massachusetts coast, and after some time sighted a fishing schooner. They ran alongside and were started in the right direction for Race Point. Again they lost the course and were not put right until they saw Cape Cod Light, and with this as a guide they put into Provincetown. The next

closed and will leave her there until he starts on a cruise early in July. Commodore Woodward, of the Springfield Y. C., who has had a large launch built at Middletown, had intended making cruises during July and August, but it is possible that he will abandon his programme if the locks are closed, as he is unwilling to forego the pleasure that he may have with his boat while she would be lying idle at Hartford.

LAUNCH OF THE WEMCO

The auxiliary yawl Wemco, designed by Small Bros., of Boston, for C. C. Warren, of Sandusky, Ohio, was launched on May 26 at the yard of Hugh Bishop, in Gloucester, Mass. She is of wood, 68 ft. over all, 49 ft. waterline, 16 ft. breadth and 5 ft. 10 in. draft of keel, with 11-ft. draft with board down. The motor is a Rochester 12-h.p. She is yawl-rigged, for cruising, with 3,000 square feet of sail. When completed she will sail to New York and then tow up the Hudson and through the Erie Canal to Buffalo, where she will be rigged anew for the cruise through Lake Erie to Sandusky. Mr. Warren is commodore of the Sandusky Y. C. and of the Inter-Lake Yachting Association.

TRIAL TRIP OF THE VIXEN

The new steam yacht Vixen, designed and built by the Gas Engine & Power Co. and Chas. L. Seabury & Co., of Morris Heights, has proved very successful on her builders' trial on the Hudson. She was designed to carry her owner, John D. Archbold, between his home in Tarrytown and his office in New York, with sufficient accommodation for cruising on Long Island Sound. On a run of nine miles she averaged 23.70 miles. She is 100 ft. over all, 12 ft. breadth and 5 ft. draft, with Seabury engines.

LAUNCH OF THE HAUOLI

The new steam yacht Hauoli, designed by Henry J. Gielow for F. M. Smith, was launched on May 31 at the Erie Basin Drydocks, where she has been built under the superintendence of Capt. W. D. Dickey. She is of steel, 153 ft. 6 in. over all, 122 ft. 9 in. waterline, 17 ft. 6 in. breadth and 9 ft. 8 in. depth of hold. She is well arranged and very completely furnished for cruising service. The contract speed is 18 miles for a consecutive run of six hours, with natural draft.

The steel steam yacht Safa-el-Bahr, formerly owned by the Khedive of Egypt, has been chartered by Col. F. L. Leland, of New York, to Charles H. Schwab, president of the United States Steel Corporation. She is now in the Mediterranean, but will soon be seen on this side of the Atlantic. She was designed and built by A. & J. Inglis, of Glasgow, in 1894, and is 221 ft. over all, 187 ft. l.w.l., 27 ft. breadth and 15 ft. depth of hold.



MARGARET-ELECTRIC AMBULANCE LAUNCH

into commission an elegant new launch which has been completed for him by Reuben E. Hill, of that place.

ELECTRIC AMBULANCE LAUNCH

The launch here illustrated was recently built by the Electric Launch Co., of Bayonne, N. J., for a peculiar service and is the first ambulance launch yet turned out. The Margaret, as she is named, after the daughter of the donor, Isaac N. Seligman, is intended to carry sick children between the Seaside Hospital, at New Dorp, Staten Island, and the floating barges of the hospital and the St. John's Guild, which are anchored about a mile off shore on account of the shoal water in that part of the Lower Bay. The launch, which carries 40 adults or 60 children, is 38 ft. over all, 9 ft. breadth and 2 ft. draft. The power is in the form of one of the company's marine electric motors of 8-h.p., located well aft below the floor, with storage batteries giving a radius of 60 miles; the highest speed being 10 miles. The standing roof shown is provided with side curtains of pantasote, for rough water or bad weather. The roof is fitted with a special long hatch, through which a stretcher may be lowered or hoisted from the hospital barge. But one man is necessary for the running of the launch, and the batteries are charged from the lighting plant of the shore hospital.

attempted to secure a pilot to guide them around the Cape, but no one would go out day the seas continued high, and the party in the launch in such heavy weather. They were obliged to remain in port, and toward evening secured a pilot and a start was made. The launch arrived in Newport on Saturday after a hard tussle against the wind. Mr. Cutler had been taken sick at Provincetown and made the trip to Newport by rail, joining his party there, and the launch was pushed westward for Watch Hill, where she entered Fisher's Island Sound and ran up to New London, then on to the Connecticut River, arriving at Essex on Sunday, reaching Springfield in the evening, after having encountered some obstructions in the canal at Windsor Locks.

The launch will need a good deal of putty and paint to restore her appearance, but otherwise she is in good shape. While the situation was at no time dangerous, the party would not care to repeat its experience. The boat's seaworthiness and general behavior on the trip filled her owner with confidence in her qualities. The Nautilus is the largest power boat on the Connecticut River above Hartford, with the exception of an excursion steamer. As it is proposed to repair the canal locks early in June, Mr. Cutler will probably take his boat down the river just before the locks are

The Automobile and WEEKLY MOTOR REVIEW

VOL. VI

NO. 14

Issued every Saturday by
The Class Journal Co.

MAIN OFFICE, 395 Broadway, NEW YORK CITY
Telephone 3405 Franklin

Western Office - 356 Dearborn Street Chicago

OFFICERS

H. M. SWETLAND, President and Gen'l Manager
EMIL GROSSMAN, Vice-President
F. L. SWETLAND, Treasurer

TERMS—\$2.00 per year, 10 cents per copy; foreign,
\$3.00 per year, postage paid.

Do not send currency by ordinary mail in payment
of subscriptions. Remit by Check, P. O. or Express
Money Order, or register your letter.

EDITORS

W. P. STEPHENS, New York
HERBERT L. TOWLE, New York
H. W. PERRY, New York
E. RALPH ESTEP, Chicago

News copy should reach us Tuesday; telegraphic
matter up to Wednesday noon.

Copy for advertising should reach us Saturday,
but will be inserted if in hand Monday.

Copyrighted 1902. All Rights Reserved.
Entered at the New York P. O. as second-class matter

SATURDAY, JUNE 7, 1902



WITH the present
issue *The Automobile*
and the *Motor*
Review are consol-
idated in one week-
ly publication—
The Automobile and
Motor Review.

This combination
is the result of demands long stand-
ing on the part of the readers of
the *Automobile* for a weekly is-
sue; and from the readers of the
Motor Review for a higher class of
technical matter. The effort will be
made to meet both demands by a
live semi-technical and news journal,
retaining the best features of each,
and issued once a week. The efforts
of the same editorial and business
staff will be concentrated on the one
paper.

This change has necessarily been
more or less hastily made, and owing
to the two very important events
which demand consideration in this,
the initial issue, some apology may
be necessary for possible defects and
crudities. If perfection were obtain-
ed at the first attempt, no ideals
would remain as rewards for further
effort.

All subscribers to either paper will
receive *The Automobile and Motor*
Review each week until their sub-
scription expires; after which the
price will be two dollars per year.

USE AND ABUSE OF RACING

It is not too much to hope that before
many years the motor vehicle will have
reached such a point of popular apprecia-
tion as has long been enjoyed by the horse
and the locomotive; and that the question
of its highest possible speed will be dis-
placed by the more important one of its
most useful and economical speed. For the
time being, however, racing has a place of
its own in stimulating the public interest
and in spurring inventors to new achieve-
ments. Those who are familiar with the
developments of the past two or three years
in France recognize two very important
facts—first, that this year's road car of mod-
erate speed and power is a far superior ve-
hicle to its predecessor of 1901; and, sec-
ond, that this improvement is directly due
to the efforts of the leading builders in the
line of racing cars for the great road races
of 1901. The improvements in the line of
strength, lightness and certainty of opera-
tion of the motor, which made the records
in the Paris-Berlin race, have since that
time been adapted to cars for every-day
road service.

If road and track racing are to continue,
and we believe that both have their uses,
not only must new safeguards be intro-
duced, but a clearly defined line must be
drawn between the good and the bad. Up
to the present time there has been no at-
tempt to establish any such limitation but
ambitious designers and reckless drivers
have been free to follow the mad craze for
speed alone, regardless of all practical and
prudential considerations. The courses, or
a very large proportion of them, have been
open freely to every variety of dangerous
and useless freak that perverted ingenuity
could suggest. The result of this license,
told this week in every paper in the coun-
try, is after all far more shocking than sur-
prising.

Even the opponents of racing must ad-
mit that there is a certain justification for
such a vehicle as now holds the double
honor of the road record from Paris to
Berlin and the mile record made last fall
at Coney Island. It can, when just fresh
from the track, be fitted with its tonneau
body in a few minutes and started on a
road run or a tour, carrying a party of half
a dozen; and the practical experience gained
in its construction a year ago has since
been directed to the production of a most
useful and sensible road carriage. In strong
contrast to this line of racing development
are such useless freaks as the racing spider
which ran last fall at Coney Island, and the
hideous road torpedo which wrought such
havoc on Saturday. Unlike the Fournier
car, these machines were built for speed on

the mile course, and for no other purpose.
Such transient speed as they possessed was
not due to the skillful combination of all
the elements of a complete motor vehicle—
weight, horse power, fuel capacity, etc.—
but to the elimination of some of the most
important of these elements and the undue
exaggeration of a few that were necessarily
retained. In place of the serviceable frame
which forms the foundation of such cars as
the Winton and the Mors, with its perma-
nent front seat and detachable tonneau,
there was but a skeleton of light tubes or
a light wooden shell, mounted on light wire
wheels and weighted with heavy batteries;
the driver and assistant being strapped for
the time being in unnatural and uncomfort-
able positions. That such a machine, flying
light and performing no useful work, should
move faster by a few seconds than anything
previously produced, is no credit to its con-
structor and no addition to the mechanical
knowledge of the world.

If racing is to continue it must be under
such restrictions as will bar all freaks and
reserve the courses to useful and practicable
cars, stripped for the occasion, within rea-
sonable limits, but capable of speedy res-
toration to ordinary road condition. Such
special preparation as was reported in the
case of one proposed starter last fall, of
the replacing of the regular driver's seat by
a bicycle saddle and of the regular fuel tank
by one holding barely enough gasoline for
the mile course, should be rigidly prohib-
ited. The racing should be limited to prac-
tical road vehicles, with only such special
preparation as the temporary removal of the
tonneau and similar detachable parts not
needed in a race.

There will no doubt arise certain difficult
points of detail in formulating and apply-
ing rules for the exclusion of the racing
machine; but the broad principles which
mark the line of demarcation are plain
enough to warrant immediate action. It is
not necessary at the present time to con-
demn either the clubs which have failed to
legislate in time against the freak racing
machine, or the inventors who have taken
advantage of the omission; but there can
be no possible excuse for the future negli-
gence or inaction in a matter which affects
the whole future of the motor vehicle.

THE PARIS-VIENNA RACE

But little has been heard for some time
past of the great road race from Paris to
Vienna projected last year for this summer,
and there has been some doubt as to wheth-
er official authorization could be secured or
whether this event would meet the fate of
its predecessor, the Nice-Abbazia-Nice race.
It is now reported, however, that the ear-
nest efforts of the French motorists may
be successful and that the official announce-
ment of the authorization may come at any
time. The probable date is given as within
the last week of this month, about June 25,
26 and 27.



A NEW MILWAUKEE COMPANY

\$1,000,000 Concern to Be Organized to Operate the Plant of the Milwaukee Automobile Co.—
Johns-Manville Suit and Extensions

MILWAUKEE, WIS., June 2. (Special Correspondence.)—J. H. Turner, of the law firm of Turner, Pease & Turner, stated in an interview with the representative of THE AUTOMOBILE AND MOTOR REVIEW, that a new company with a capital of nearly \$1,000,000 will be organized to continue in operation the plant of the Milwaukee Automobile Co., assigned. Although he was inclined to be reticent, Mr. Turner said that negotiations are now pending which may result in giving Milwaukee an automobile factory that will rank among the largest in this country so far as capital and output are concerned.

"It is hardly time to talk about the project," said Mr. Turner. "All I can say now is that St. Louis, or perhaps Cleveland, capital will be invested in the plant, and if the thing goes through as is now planned it will create a surprise in the motor vehicle industry so far as the manufacturing end is concerned." Without quite saying so, Mr. Turner created the inference that the Cleveland man who is expected to invest a large amount of capital in the plant is known throughout the country. The plant of the Milwaukee company is a large one and its capacity could easily be increased to double its past output.

The receiver is closing up his work as rapidly as possible and is selling the finished vehicles in Chicago and other cities. It is not yet known what effect the recent verdict against the Milwaukee company and in favor of the Whitely Steel Co., of Muncie, Ind., will have, but it is thought that the Whitely company will be unable to collect.

Covering Company Starts Suit

An unusual and peculiar mistake made in a deed is the cause of a suit that was filed in the circuit court here Saturday by the H. W. Johns-Manville Covering Co. against the Racine Fire Engine & Motor Co., of Racine, Wis. The latter company recently purchased from the plaintiff a piece of property for \$4,000 cash and upon condition that it assume a mortgage for \$7,000. The warranty deed, it is alleged, failed to mention the mortgage and the defendant corporation has thus far refused to accept a corrected deed. The court is asked by the plaintiff to reform the deed.

C. D. Manville, one of the officers of the recently consolidated H. W. Johns-Manville Covering Co., left here a few days ago for

St. Hyacinth, near Montreal, Canada, where he will assume charge of the extensive interests recently acquired by the company at that place. The company reports excellent progress with its extensive building operations in Wauwatosa, near Milwaukee. It is stated that in addition to the projected paper mill at that place next spring, the company will also put up a new building on Second St., near the present plant, about the same time. There is also some talk of moving the Brooklyn plant to this city, as the company has more orders than it can fill under the present conditions.

The local plant of the Johns-Manville Covering Co. is five stories high and occupies nearly the entire portion of a block on Clybourn St., near Fourth.

CENTURY PROGRESS

The Syracuse Company Having Established Agencies in All the Leading Cities, Will Open Salesrooms in New York—Other Syracuse News

SYRACUSE, N. Y., June 2. (Special Correspondence.)—The Century Motor Vehicle Co. expects to establish a salesroom of its own in New York City in a short time. Arrangements have been made for representation in all of the leading cities, one of the latest agencies having been placed in Kansas City with a large house, which had had negotiations with many of the leading manufacturing concerns before closing with the Century people. The Century company has adopted a plan, suggested by Fred H. Elliott, Jr., who recently joined the company, of sending out monthly circulars or pamphlets entitled "Talk That Tells." These describe new features of the Century steam vehicles and tell what the machines are doing on the road. They are sent out to a large number of persons who are considered possible purchasers. The Century company has in hand orders for a gasoline tonneau and a gasoline runabout, to be shipped to Australia as soon as they can be completed.

Mr. Van Wagoner has been making some speed trials with the Silver King steam touring wagon, that won a blue ribbon in the Long Island endurance contest on April 26, and is so well satisfied with the results that he says he will make some attempts on the world's record at the State Fair track during the exposition in September. He will probably also try a gasoline machine.

Renters Want Two-Seated Vehicles

The Syracuse Automobile Co., in South Warren St., now sells Locomobiles, Oldsmobiles, Waverleys, Wintons and Murray

cars. A new feature of the business is the renting of vehicles for \$1.50 the first hour and \$1 for each succeeding hour. A. W. Perry, manager of the company, who succeeds Fred V. Sherman, says that the renting feature might be made a large part of the business in any town. He only allows machines to go out without a driver to persons whom he personally knows can run a machine. The trouble with the renting business now is that the average company cannot carry enough two-seaters in stock to accommodate the public, and a four-passenger carriage is generally what is wanted. The company is having an 82-gal. gasoline tank buried outside the building, and all the gasoline will be drawn on the outside. This is owing to the wishes of insurance companies, which threatened to raise the rates.

Industrial Machine Co. to Move

The Industrial Machine Co., of Phoenix, will move to East Water St., Syracuse, where it will make the De Long motor vehicles and the De Long motor bicycles. The company is composed of Syracuse people. It is rumored that Henry L. Trebert, formerly superintendent at the factory of the Stearns Steam Carriage Co., will be connected with the company.

H. J. Leighton, who has confined himself heretofore to building marine motors, will build an experimental automobile, and if it is a success he may go into the business. He intends to make a 2-cycle, 8-h.p., 3-cylinder gasoline machine, to weigh 1,200 to 1,400 lbs. Mr. Leighton has every facility for making a good machine and has had many years of experience in the marine motor line.

EDISON'S NEW BATTERY

Unwarranted Claims Made for It by the Daily Press Are Repudiated by the Inventor—To Be Tested Thoroughly

One of the leading metropolitan dailies, with the customary newspaper disregard for the plain, unvarnished truth, last week resurrected the story about Thomas A. Edison's new storage battery, and dished it up as a new sensation for the public. Extravagant claims were made for it and credited to Mr. Edison, who was alleged to have declared the battery to be a proved success and to have prophesied that electric vehicles are, beyond a doubt, the coming automobiles, because with the new battery they could be made cheaper, more simple to operate, less noisy and less dangerous than any other type of motor propelled vehicle.

The truth of the matter is that the newspapers have been taking decided liberties with the hard-working and brainy inventor, and in consequence a distinct damage may have been done, not only to Mr. Edison's interests, but as well to many others. What may really be accomplished by the battery time will tell. It is Mr. Edison's intention to put his battery to a severe test that will last for months, and no attempt will be

made to manufacture for the market before it is proved an absolute success and satisfactory in every way to the inventor's exacting requirements. The battery is not entirely new, having been on exhibition all last season at the Pan-American Exposition, but it is still regarded by those connected with the Edison laboratory in Llewellyn Park, N. J., as an experiment.

It has been said for Mr. Edison by men unauthorized to speak for him that he is planning to put an automobile within the reach of the man of moderate means. His new battery has been referred to as cheaper in construction than anything of the kind ever before attempted. Exactly the opposite is the truth. If Mr. Edison's invention demonstrates its durability it will still be more expensive in first cost than the lead batteries in the market. Mr. Edison claims only that his battery will occupy about the same space as the present battery, but will weigh only about 70 per cent. as much and that it will be more durable. What he hopes and expects to demonstrate by the tests which he will instigate is that the battery will drive a vehicle over 100 miles of country roads without recharging and without great reduction of voltage.

"My battery," said Mr. Edison recently, "weighs about 332 lbs. It consists of 21 cells. This, I believe, is equal to 55 lbs. per horse-power hour. In the past I have nickel-plated the cells, and by so doing have made them durable under all circumstances. It is unnecessary to nickel-plate the cells, however, if the battery is not permitted to go dry. That is said in answer to the assertion that the nickel may flake or crack and thus ruin the cell.

"With a Baker vehicle equipped with a battery such as I have described, I made the tests over the New Jersey roads, which led me to believe thoroughly in the practicability of the battery, and I am going to start an automobile out during the first week in June for an endurance test of 5,000 miles. I shall make five separate tests of this kind with different machines, and if I do not produce a battery that will last for more than 5,000 miles I won't sell a single one of them."

Mr. Edison asserts for himself that he is sorry to have been made the victim of unwarranted tales. He expects to produce a battery which will be a marked improvement, but, as is his habitual conservative policy, he will make no claims for his invention until it is a proved success.

CHANGE OF OWNERSHIP

The Garden City Spring Works, Twentieth and Purple Sts., Chicago, has succeeded to the business which has for the past twenty-five years been conducted by Dobbins & Co., and will continue the manufacture of the same widely known line of vehicle springs. The new proprietors of the business are having constructed new machines especially intended for the work and will soon be in a position to greatly increase the factory capacity.

MELANGE OF TRADE BREVITIES

The Macker Bros., Westborough, Mass., are reported to have just closed a contract to build a number of automobiles.

The Haschke Storage Battery Co., of Chicago, has removed to more commodious offices in suite 417 Roanoke Bldg., 145 La Salle St., Chicago.

The New York Motor Vehicle Co. has removed its office to 72 Second Place, Brooklyn, N. Y., and the company is now well established in its new home.

A preliminary certificate of dissolution of the New London Messenger & Automobile Parcel Delivery Co., New London, Conn., has been filed with the secretary of state.

The Chelsea Mfg. Co., of Chelsea, Mich., expects to have its new gasoline machine completed by Decoration Day. If the tests then are satisfactory it will offer them to the trade.

W. H. Webster, 10 West 60th St., New York City, has taken the uptown agency for the Thomas B. Jeffery Co.'s gasoline Rammers, and expects soon to handle a tonneau-bodied gasoline vehicle which will retail at \$1,500.

The Banker Brothers Co., New York agents for the Peerless and Pierce machines, are moving to 50 West 43d St., where they will occupy quarters more suitable to the demands of their rapidly growing business.

Ryas & Theis, who formerly conducted the storage and repair station at 331 South Main St., Los Angeles, Cal., have removed to their new quarters at 116 E. 7th St. They are exclusive agents for the White steam carriages.

Several Philadelphia capitalists have been in New Haven, Conn., looking over the factory of the New Haven Wheel Co. with the idea, it is said, of establishing an automobile manufacturing plant. The building is a very large one, and has been vacant for some time.

Carl Simonsen, of Simonsen & Nielsen, Copenhagen, is at the Astor House, Broadway, New York City, this week, and will remain until about June 10, when he will visit Chicago and other Western cities in the interest of his firm before returning to Denmark.

The Empire Storage Battery & Mfg. Co., 42 East 23d St., New York, has recently begun the manufacture of storage batteries for station, traction, signal and launch work. J. P. Dutton and George F. Cook are, respectively, president and secretary-treasurer of the concern.

A report from Keene, N. H., is to the effect that President Edward P. Wells, of the Steamobile Co., has bought up the shares in that concern formerly owned by

Keene people. The general plan of the company will remain unchanged, and Vice-President Rogers will continue to be manager.

The Chicago Motor Vehicle Co. has sold a 'bus and a three-seated coach, to be used between Milwaukee and Cedarburg, Wis. On May 29 at 5:30 o'clock the vehicles left Chicago for Milwaukee overland. They were just out of the factory and had not "limbered up," so the overland trip was undoubtedly a severe test.

The business of E. G. Eager & Co., of Toledo, Ohio, dealers in automobile and bicycle supplies, has been placed in the hands of a receiver upon application of the National Bank of Commerce of Cleveland, which has a claim for \$8,000. The firm consented to the appointment of the receiver for the protection of its creditors.

The Consolidated Automobile Co., of Westboro, Mass., has been purchased by the Rhode Island Automobile Co., of Providence, W. E. Taft, of the former company, continuing as manager. The company will manufacture both steam and gasoline runabouts, and, in addition to its facilities for new work, it maintains a very complete repair department.

Since the Midgley Mfg. Co., of Columbus, Ohio, has moved into its new plant and put its artillery wheels in the market, it has been crowded to its fullest capacity to get out the orders on its books. The company is now getting in position, however, as rapidly as possible to accept unlimited orders, by increasing its machinery and tools and adding to its force.

Exports of automobiles from the port of New York for the week ended May 31 were as follows: British possessions in Africa, 1 pkg. motor vehicles, \$750; Liverpool, 4 pkgs. motor vehicles and material, \$99; London, 40 pkgs. motor vehicles and material, \$15,604; Mexico, 1 pkg. motor vehicles, \$1,000; Rotterdam, 1 pkg. motor vehicles and parts, \$110; Southampton, 1 pkg. motor vehicles, \$1,200.

George F. Chamberlain, of the Automobile Club of America, who recently ordered a Mercedes carriage from Cannstadt, Germany, is in receipt of the information from the Daimler company that 40-h.p. carriages ordered now will be ready for shipment in July or August; 28-h.p. machines cannot be delivered before September, and orders now given for 20-h.p. vehicles will be filled in September or October.

The Ajax Motor Vehicle Co., although but a new concern, is already considering an enlargement of its plant, now located at 220 West 36th St., New York. The present manufacturing facilities are unequal to the demand for the natty little electric runabouts, and A. L. Simpson, president and general manager of the company, reports that his company contemplates branching out on a large scale.

Foreign Topics

FRENCH ALCOHOL TRIALS

The Opening of the "Alcohol Circuit of the North"—
The Speed Trials on Bad Roads with
Alcohol as Fuel

PARIS, May 19. (Special Correspondence.)—A stubborn teetotaler, anyhow an anti-alcoholist gentleman, the clerk of the weather must be, if we are to judge him on his latest deportment. All he could possibly do to spoil or ruin the Northern Alcoholic Circuit he did with a vengeance. Wind, rain and hail were his weapons. Never was a by-road battle fought under more adverse climatic conditions. The men ran through gales and storms. The course, which is a very trying one under any circumstances, was made infinitely harder, and the journey of the unfortunate "alcoholists" along the northern sea and channel coast may only be termed crucial. Still they went through the ordeal gamely and snatched victory out of the water, so to speak; for victorious they were in the end, and all these drawbacks arising from the weather and roads served only to make the experiment more conclusive.

In the Speed Class

The winner of the speed event, irrespective of class, turned out to be Maurice Farman. He came in an easy first, beating the second man, Jarrott, by about one hour, both steering Panhard vehicles of the improved Paris-Berlin pattern, a most creditable achievement for both men and machine, and a very auspicious start for their 1902 season.

Maurice Farman is not an unknown. Once a champion of the wheel, he, like Fournier, Charron, Beconnais and so many more, made a name for himself in the motor arena last year by carrying the "Paris" circuit. M. Farman, an Anglo-Frenchman by birth, is a happy mixture of the best characteristics that have made both races great; he combines, to a rare degree, the daredevilness and dash of the one with the cool-headedness and pluck of the other and these are qualities that tell on any battlefield.

The Old Panhard Wins

The victorious machine was a Panhard and Levassor of the Paris-Berlin revised and lightened type. The great old firm being unable to turn out in time one of its Paris-Vienna newest patterns, had to fall back on its old stock. Any one who realizes how delicate a task it is to bring forth in the pink of mechanical condition one of those speed monsters capable—as M. de Knyff's car will be, they say—of reeling off a kilometer inside 30 seconds, will not be surprised at the French concern being late. But it made the best of the hard lines. To

comply with the new regulations, that limit the weight to 1,000 kilos, the old speed horse that turned the scale at 1,200 kilos had to put down flesh to the extent of 200 kilos. No easy job. But the French engine trainers were equal to it. The one-year-old Panhards were brought down to the 1,000 legal mark, and lost nothing of their sterling excellence and steadiness in the process, as the result showed. Out of 3 Panhards that faced the starter 2 finished first and second, and there was no fault with the third, which had one wheel broken through an unlucky bit of steering on a sharp curve. That diminution of weight was mainly obtained by the introduction of hollow axles made of a single tube, with several reinforcements where they were needed to stand the strain. Thanks to the

to 100 at times, with the frame actually striking the 12-kilo axle, and the latter stood the strain beautifully. That speaks volumes for the stuff out of which our vehicles are made; it proves their anatomy to be equal to anything that may be wanted from them as far as mere endurance goes. New motors may come now; the frames of the vehicles will not be found lacking.

Alcohol for Steam Generation

Next to the winning performances, but equally meritorious in its way, we must single out Serpollet's deed. The champion of steam had 4 vehicles entered, 4 started and 4 finished "strong and well." After his legendar 29s. 4-5 kilom., M. Serpollet's ambition was to try his hand at distance work, and he deplored that the suppressions of Nice-Abbazia had robbed him of the chance. On a long journey, regularity, he said, was most to be aimed at. "All starters should be finishers; that is the criterion of excellence." That summed up his personal opinions on the point. Now he has reached the goal, and added another



NORTHERN CIRCUIT—MAURICE FARMAN FINISHING

exceptional quality of the material, the weight of those axles could be reduced to 12 kilos, with a corresponding 180 kilos resistance power for every one square millimeter—a millimeter is the twenty-fifth fraction of an inch—a clever trick, according to all competent mechanics. Thus have 80 kilos been gained on the Paris-Berlin vehicle weight and at no expenditure of strength; in fact, the new axles are even stronger.

A Practical Road Test

That this is no idle contention was amply borne out by an incident of the race. One of the springs of Farman's car, a useless one, which an engineer would have suppressed, and which Farman insisted on retaining, came loose, but that did not prevent the car from covering its last 500 kilos at a pace which must have been close

laurel to his crown. That alcohol and steam, which some thought irreconcilable enemies, can combine their efforts to their common advantage no one henceforth will doubt.

The Triumph of Alcohol

And what of the principal actor in the play just over, Alcohol? Well, to put things mildly, he was the great conqueror of the day. Those 865 kilom. in 12h. 1m. 23s., or at an average pace well over 70 kilom., are simply marvelous, in view of the surroundings—trying course, wretched weather, heavy roads and those new regulations which we recently dealt with. In connection with alcohol, it is but fair to mention the name of M. Lepetre, the distinguished chemist, who was the introducer of that special alcoholic mixture that carried to victory all yesterday's winners, and

was instrumental in bringing forth the triumph of the national fuel.

The tires behaved remarkably well, too. The time is past when the road used to literally swallow the tires, and mountains of repair pneumatics had to be stocked in at every stage of the course. Farman had no trouble with his Continental; neither had Jarrott, Marcellin, Grus and Bardeau with their Michelin. That's for another improvement and the net result of racing, too.

The Night Before the Battle

The scene in Paris during the dark hours that preceded the battle was another edition of the Paris-Berlin historical night: lively and picturesque to a degree. Down the Daumesnil and Vincennes avenues fantastical shapes of motors kept gliding along amidst an awful roaring. On the footpath stood an amazed crowd of onlookers, who watched curiously these mechanics, and would not be turned off by the thin, drenching rain, while files of cyclists hurried to the rendezvous; the "allies" of the popular "Bois de Vincennes" literally swarmed with silent steeds, whose acetylene lamps gleamed through the darkness of the night like erratic stars. A dark, very dark, night indeed, and damp, too, and cheerless.

An Unpropitious Start

As the day was about to break it looked as if the sun would conquer, but that was not to be, and rain set in again and all hopes of a fine day disappeared when the men were called to the mark and dispatched on their long, tedious journey.

Out of 81 entries 55 faced the starter. R. de Knyff opened the ball at 4 o'clock sharp, Farman following him at a 2-minute interval, then Jarrott another 2 minutes later and so on, the last man, A. Ducros, being sent off at 5:36.

We will not follow them through the various stages of their hard grind, but will hurry to the finish. Rain they had at the start, rain hunted them all along the road and rain awaited them at Arras, the first halting place.

The Second Day

The weather on the second day was just as bad as on the first; rain kept pouring from the early hours; to enliven matters hail put in an appearance now and then, and, with the gale blowing in the teeth of the drivers, the traveling at 50 miles was rendered anything but pleasant.

Once more M. Farman finished in front, with Jarrott and Marcellin second and third. The winner's time for the return journey, through Boulogne, being 7h. 7m. 46 4-5c. racing distance, 482 kiloms. By adding the times of each day the general classification, irrespective of categories, stands as follows for the leaders:

1, Maurice Farman (motor car), 12h. 1m. 52 3-5s.; 2, Jarrott (motor car), 13h. 9m. 12 4-5s.; 3, Marcellin (light car), 13h. 9m. 22 2-5s.; 4, H. Farman (light car), 14h. 16m. 14 1-5s.



INDIANAPOLIS RACE MEET

Decoration Day Events Draw a Good Crowd—Eight Starters in Race for Gasoline Runabouts—Four in Heavy-Weight Class

INDIANAPOLIS, IND., May 31. (Special Correspondence.)—The feasibility of giving a successful automobile race meet in Indianapolis was demonstrated yesterday afternoon, when 2,000 spectators watched the races at the State Fair grounds with unbounded enthusiasm.

Eight gasoline machines started in the 5-mile race for vehicles in the 800 lb. class. Six of them were Oldsmobiles, one a Rambler and the eighth a Spaulding. The eight machines got away together prettily, and there was some interesting jockeying for position. In the third mile Frank Moore drove his Oldsmobile to the front. The others went after him, but he kept the lead and won in 12:05. George Pangborn (Oldsmobile) was second, Fred Wasson (Oldsmobile) third, John Merz (Rambler) fourth, Henry Wilke, of Richmond (Oldsmobile), fifth, H. H. Rea, of Rushville (Oldsmobile), sixth, Sidney Elston (Spaulding) seventh, and Fred Hoffman (Oldsmobile) withdrew.

The Race for Heavy-Weights

Probably the most exciting event was the 3-mile race for gasoline machines in the 2,000-lb. class. Three Wintons and a Haynes-Apperson contested. The four were not separated three lengths during the entire race and the going was terrific all the way. In the last mile the lead changed frequently. Beginning the last quarter, Charles Somers came around from fourth place to the lead and maintained his advantage to the end. His time was 7:35. M. O. Reeves (Haynes-Apperson), was second; Dr. Harry Jones (Winton), third, and J. A. McKim (Winton), fourth.

Fred M. Ayres, in his Winton touring car, made a mile against time in 1:57. His intermediate times were 58 sec. for the half and 1:12 3-5 for three-quarters.

The Motor Bicycle Events

Fred Brandt, on a motor bicycle, gave the running horse Mozette an eighth-mile start in a mile race and won by a narrow margin.

Sidney Elston, in a Waverley electric, won a 3-mile match race from John Merz in a National electric by 20 yds. in 8:35.

The 3-mile motor bicycle race was won by Cecil Gibson on a Merkel, in 5:02 1/4. Gibson had a handicap of a quarter mile and won easily. Harry Brandt, on an Orient, was second, and Oberderff, on a Fisher

motor bicycle, lost control of his machine and withdrew.

Despite exceptionally poor street railway facilities and gloomy weather the society folk turned out strong to see the races, and the promoters are encouraged to such a degree that they will probably give another meet on July 4.

A dispute has arisen over the distribution of the prizes in the bicycle events.

CHICAGO ENDURANCE CONTEST

CHICAGO, ILL., June 2. (Special Correspondence.)—The 100-mile endurance contest committee of the Chicago Automobile Club has decided to establish six controls, 15 miles apart, along the route of the run, in order to prevent illegal speeding. These controls will be marked by red banners, and at the 5 and 10-mile points between controls there will be white banners, thus enabling operators and observers to better gauge the speed of their vehicles. No operator will be permitted to pass the first control, 15 miles from the start, before 1 hour and 15 minutes has elapsed from the time of his start. The second control cannot be passed until another hour has elapsed, and each successive control must be passed not less than one hour later than the preceding one, up to the sixth control, at 90 miles from the start. One hour will also be required for the last 10 miles, which is inside the city limits. The total minimum limit for the 100 miles will be 7 hours 15 minutes.

Observers will be assigned to cars operated by the motive power with which they are most familiar, and the observer must occupy the seat with the driver. The contest will be started promptly at 9 o'clock, a car being sent out every 30 seconds until all have been sent away.

FIRE DAMAGES CLUB VEHICLES

PHILADELPHIA, PA., May 31. (Special Correspondence.)—A fire that did considerable damage to the machines of many prominent automobilists of this city broke out on May 20 in the three-story brick building at 250 to 254 North Broad St., occupied in part by the Pennsylvania Electric Vehicle Co. The 25 vehicles stored on the second floor, which it was impossible to remove, under the conditions, were badly damaged by fire and water, the bodies of the majority of them being warped.

Fully 75 vehicles were housed on the lower floor, and as soon as the fire was discovered these were pushed or propelled by their own power out on to Broad street,

and were taken thence to the Wanamaker automobile station, at Twenty-third and Walnut streets. Superintendent T. B. Entz, of the Pennsylvania Electric Vehicle Co., did yeoman service in clearing the lower floor of vehicles, and made an attempt to put the elevators in operation in order to get out the machines on the second floor, but was driven back by the flames.

General Manager Frank C. Lewin, of the local branch of the company, whose factories are at Hartford, Conn., approximates the loss to his concern at \$40,000, covered entirely by insurance. The majority of the vehicles stored and being repaired on the second floor were the property of members of the Automobile Club of Philadelphia, and the fire has interfered with their plans materially.

AUTOMOBILES AT A JUBILEE

SPRINGFIELD, MASS., May 31. (Special Correspondence.)—Springfield's Golden Jubilee, celebrated this week, has kept the automobile repair stations well supplied with work caring for vehicles which came in from long distances, and putting in prime shape those in the city. Great interest is taken in the record run made by two automobiles from Boston on Monday. Mr. and Mrs. P. N. Goodrich and Mr. and Mrs. Philip Gokey made the trip to this city, a distance of 100 miles, in 5 hours and 15 minutes. Only one automobile succeeded in keeping its place in the big parade Monday. Messrs. Whitten and Blaney, with their Warwick, were able to follow in the slow moving line without overheating their engine and continued to the end of the course. Other vehicles which started dropped out one by one either on account of overheating or the vexatious delays in running behind marching men.

CLEVELAND CLUB NEWS

CLEVELAND, O., June 2. (Special Correspondence.)—The Cleveland Automobile Club held its annual banquet and election of officers at the Euclid Club last Friday. A movement was started that will result in at least a dozen club runs this summer. The committee in charge of race meets reported that matters were progressing which will probably result in the holding of a good race meet this summer. E. Shreiver Reese was chosen president; George L. Weise, vice-president; George Collister, secretary, and Windsor T. White, treasurer. E. L. Strong, the retiring president, was chosen chairman of the executive committee.

MR. SCHWAB'S NEW MERCEDES

Charles M. Schwab, president of the United States Steel Corporation and an automobile enthusiast, is reported to have just ordered another Mercedes from Germany, to be delivered in July. A condition of the contract, it is said, requires the makers to furnish Mr. Schwab with an automobile that can cover a mile in 40 seconds. The carriage is to be fitted with a 55-h.p. engine

and in general outline is to be a duplicate of the machine that W. K. Vanderbilt, Jr., is now using in Paris. It will be constructed to carry four persons, and is to be made at the Daimler works in Cannstadt, Germany.

STATE BOILER INSPECTION

MINNEAPOLIS, MINN., June 1. (Special Correspondence.)—E. E. Steele, state boiler inspector for this district, has announced that every steam vehicle that is to appear in the Elks' street carnival parade, to be held here on June 10, must first undergo an inspection of the boiler. This is in conformity with the state law providing for boiler inspection. Mr. Steele says that many owners of steam vehicles have already called upon him voluntarily for inspection. Inspection by the state inspector costs \$5 and must be submitted to every year.

ROAD USERS GETTING TOGETHER

The Associated Road Users of America is a new organization about to be launched by automobilists and other users of the roads. A meeting will be called June 10, when a plan for organization will be submitted. The objects of the association will be to urge the improvement of the streets of the cities and the highways and the building of good roads throughout the United States; the regulation of traffic and the enforcement of laws governing the same; the erection of proper street signs and guide posts; the proper lighting of streets and highways, and the keeping of the thoroughfares in good repair. Any organization whose members use the streets for any form of vehicular traffic shall be eligible to membership, which will cost \$20

a year. Automobilists, truck owners and cyclists have been represented at the preliminary meetings called by Dr. E. V. Brendon.

The resident surgeons of the Emergency Hospital, in Washington, D. C., and others interested in that institution, are endeavoring to have a motor ambulance added to its equipment. A motor ambulance was hired by the institution during a portion of the heated term last year and rendered such efficient service that the hospital authorities are desirous of securing one for permanent use. It is expected that a fund for the purchase of a \$3,000 vehicle will be started at once.

The Automobile Club of Arverne has been organized at Arverne, Long Island, and is now building a \$7,000 clubhouse on Merideth Ave. and the Boulevard. The building will have a 60-ft. front and be 80 ft. deep and two stories high. The upper story will be fitted for bachelor apartments and a reading room.

The Brockton, Mass., automobilists complain bitterly against the recent law passed by the State legislators restricting speed to 10 miles within city limits. Owners have been looking up the records, and found that a man can run that fast, the record for running one hour being 11 m. 1,243 yds.

The motor vehicle is becoming popular in Cape Town, South Africa, where the South Africa Automobile Club has 25 members and is growing fast. A number of vehicles have been sold there by W. M. Jenkins, general manager for Garlick's Cycle Supply Co., of Cape Town.

DIAMOND CHAINS

LARGE AND HARD
NICKEL STEEL RIVETS

GREAT TENSILE STRENGTH
AND ACCURACY



AVOID TROUBLE BY EQUIPPING MACHINES
WITH LARGE CHAINS

AUTOMOBILE AND CYCLE PARTS COMPANY
DIAMOND CHAIN FACTORY
Indianapolis - Indiana

THEY ARE ALL COMING TO IT.



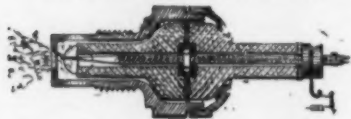
MUNGER

NON-COLLAPSIBLE
PNEUMATIC TIRE.

No Dread of Punctures. No Delay.

You come home happier than when
you started on your journey.

Send for descriptive circular which explains its construction.

MUNGER AUTOMOBILE TIRE CO.,
TRENTON, N. J.Wonderful Results
...WITH...
MOSLER SPIT FIRE
SPARK PLUG.

Protected Porcelain and Sparking Point.

SIMPLE
INDESTRUCTABLE
RELIABLE

Special Nickel Rod with Screw adjustment for accurate setting between sparking points—avoids bending and breaking of platinum points.

Reversible Porcelain—Double Life.

\$2.50 Complete.

Any Standard French or American Thread.

Special Discounts quoted to Manufacturers and Jobbers.

ARTHUR R. MOSLER,
SOLE MANUFACTURER,
309 BROADWAY, NEW YORK.

INDEX TO ADVERTISERS

Adams Co., The.....	31	Janney, Steinmetz & Co.....	32
Adams McMurty Co.....	33	Jones & Co., Phineas.....	32
American Ball Bearing Co.....	34	Konigslow, Otto.....	25
American Coil Co.....	30	Lathrop, J. W.....	40
American Darracq Automobile Co.....	47	Lincoln Electric Co.....	42
American Roller Bearing Co.....	33	Lobee Pump Co.....	39
American Tubular Wheel Co.....	26	Locke Regulator Co.....	38
Automobile & Marine Power Co.....	44	MacRae, H. C.....	42
Automobile & Cycle Parts Co.....	23	Mason Regulator Co.....	40
Automobile Co. of America.....	42	Milford Company, The.....	29
Axiom Carburetor Mfg. Co.....	35	Miller, Chas. E.....	32
B. & P. Company.....	40	Miller-Knoblock Electric Mfg. Co.....	30
Badger Brass Mfg. Co.....	29	Miscellaneous Advertisements.....	24
Baker Motor Vehicle Co.....	40	Mosler, Arthur R.....	24
Balkwill Pattern Works.....	31	Motor Cycle Mfg. Co.....	40
Beardsley & Hubbs Mfg. Co.....	40	Motor Vehicle Power Co.....	28
Besley & Co., Chas. H.....	29	Motor Vehicle Power Co.....	29
Billings & Spencer Mfg. Co.....	41	Mueller, Herman Co.....	25
Bowser & Co., Inc., S. F.....	37	Munger Automobile Tire Co.....	24
Buffalo Automobile & Auto-Bi Co.....	28	National Battery Co.....	30
Carlisle & Finch Co.....	30	National Vehicle Co.....	43
Cavanaugh & Darley.....	39	Naugatuck Mfg. Co.....	37
Chisholm & Moore Mfg. Co.....	35	Neustadt-Perry Co.....	31
Cincinnati Panel Co.....	28	Niagara Motor Vehicle Co.....	42
Clark Tire Co.....	35	Noye Mfg. Co.....	40
Cleveland Wire Spring Co.....	36	Ofeldt & Sons, F. W.....	32
Columbia Lubricants Co.....	35	Ohio Automobile Co.....	43
Conrad Motor Carriage Co.....	41	Olds Motor Works.....	43
Covert & Co., B. V.....	28	Overman Automobile Co.....	44
Crest Mfg. Co.....	41	Pignolet, L. M.....	31
Cutler-Hammer Mfg. Co.....	30	Pittsburg Reduction Co.....	31
Dayton Elec. Mfg. Co.....	31	Prescott Automobile Co.....	45
Dayton Motor Vehicle Co.....	38	Randolph-Cloves Co.....	37
Diamond Rubber Co.....	48	Reason Automatic Air Pump Co.....	35
Dietz Co., R. E.....	29	Reliance Gauge Column Co.....	32
Dixon Crucible Co., Jos.....	29	Rochester Automobile Co.....	41
Dow Portable Electric Co.....	30	Roller Bearing & Equipment Co.....	32
Dunbar Brothers.....	25	Rutenber Mfg. Co.....	39
Du Bois' Automobile Agency.....	24	Salamandrine Boiler Co.....	32
Eastman Metallic Body Co.....	36	Shaeffer, Bunce & Co.....	31
Electric Vehicle Co.....	27	Shelby Steel Tube Co.....	37
Elmore Mfg. Co.....	42	Splitdorf, C. F.....	29
Elwell-Parker Electric Co.....	40	Standard Anti-Friction Equipment Co.....	36
Erie Foundry Co.....	31	Standard Gauge Mfg. Co.....	37
Essex Brass Co., G. B.....	29	Standard Oil Co.....	37
Friedman Automobile Co.....	43	Standard Welding Co.....	32
Forg, Peter.....	38	Steam Carriage Boiler Co.....	32
Fournier-Searchmont Automobile Co.....	45	Stearns & Co., F. E.....	43
Garden City Spring Works.....	31	Sussfield, Lorsch & Co.....	27
Garvin Machine Co.....	25	Tremper's Automobile Agency.....	43
G & J Tire Co.....	34	Truscott Boat Mfg. Co.....	28
General Motor Car Co.....	25	Tube Bending Machine Co.....	37
Goodyear Tire & Rubber Co.....	36	Turner Brass Works.....	38
Gould Storage Battery Co.....	30	Tuthill Spring Co.....	31
Grant-Ferris Co.....	39	Upton Machine Co.....	40
Grout Bros. Co.....	28	Veeder Mfg. Co.....	35
Hall Mfg. Co.....	25	Weston-Mott Co.....	34
Hartford Rubber Works.....	35	White Sewing Machine Co.....	28
Haynes-Apperson Co.....	46	Wilson Carriage Co., C. R.....	28
Helios-Upton Co.....	30	Winton Motor Carriage Co.....	44
Henricks Novelty Co.....	30	Woodward Burner & Specialty Works.....	33
Hoffman Motor Co.....	28	Wolverine Motor Works.....	39
Hotelling Bros. Co.....	27	Woodruff Automobile Co.....	42
India Rubber Co.....	36	Ziegler Electric Co.....	30
International Air Pump Co.....	35		
International Motor Car Co.....	41		

Special Notices

Advertisements of second hand vehicles or parts for sale, or for Positions Wanted, inserted under this heading at 10c per line. Remittance must accompany copy.

WANTED—Position as Superintendent, Mechanical Engineer or Designer, or to do Scientific experimental work, with some automobile company, by a man of 15 years' practical experience—an expert on automobile work as a Mechanical Engineer. Address H. LAWSON, care of MOTOR REVIEW, 395 Broadway, New York City.

Miscellaneous

Advertisements under this heading will be accepted at 5 cents per word per insertion. Remittance must accompany copy. Currency at sender's risk. 2 cent stamps accepted.

HOW TO BUILD A MOTOR LAUNCH—A simple and practical work in every detail, showing how to construct a launch hull suitable for use with any description of motor. Designs of several launches, from 18 to 50 feet in length. Heavily illustrated. The most complete treatise on launch building yet published. Bound in cloth. Price \$1.00. Book Dept., Motor Review, 395 Broadway, New York.

NINE H. P. DARRACQ TONNEAU IMPORTED TOURING CAR.—Imported only a few weeks. In good order. Cost \$2,600. Will take \$2.00, to first comer. Address DARRACQ, 239 West 50th Street, New York.

FOR SALE—THE PRACTICAL GAS ENGINEER, by E. W. Longenecker. A manual of the practical management and operation of all classes of explosive motors using gas, gasoline and similar fuels. Describes the general construction, the installation, piping, ignition system and running of motors for shops, launches and motor vehicles. Sent upon receipt of \$1.00. Book Department, Motor Review, 395 Broadway, New York.

WHY pay fancy prices? Fine all leather automobile tops \$55.00; leather quarter tops, \$25.00; all rubber tops, \$18.00. Send exact measurements and \$5.00. Quick delivery. Privilege of examination. Fine leather automobile caps \$1.25; postpaid 25c. extra. Automobile Specialty Co., Station 40, West Branch, Iowa.

Just Offered

1902, Latest Model WHITE STEAMER. Used only a few days. Perfect condition. Owner going abroad offers it at a liberal discount

You Cannot

Get a better rig from the Company's show room. Also immediate delivery of WINTON TOURING CAR. Brand new, with all accessories at small premium.

DU BOIS' AUTOMOBILE AGENCY,
220 Broadway, New York.



A long spark always will jump a small gap. The new improved **Mueller Spark Coil** gives from one and one-half to two inch spark, and hot enough to melt a No. 28 iron wire; will spark several cylinders with one coil, works on 6 to 12 volts, uses from 1/4 to 1 ampere; can be used with or without vibrator. Size over all 4 1/4 x 4 3/4 x 6 1/2 inches, weight 4 1/2 lbs., contains over two miles of silk covered wire. Has a very rapid vibrator, wide range of adjustment, positively guaranteed not to break down under severe test. Sample will be sent on ten days' trial to responsible parties subject to return at our expense. Net cash price \$10.00. Not the cheapest but the best. Why pay \$1,000 for an automobile with an inferior coil to give you trouble. Demand the **Mueller Spark Coil** and your ignition troubles will be eliminated. The supply will soon be unlimited. Made and guaranteed by **HERMAN C. MUELLER**, 562 SCOOT STREET, MILWAUKEE, WIS.



Ball Races

PRESSED FROM STEEL
From 1 to 8 in. diameter
Write for Prices and Samples
OTTO KONIGSLOW
CLEVELAND, O.

RELIABLE OILING AND GREASE DEVICES. LUBRICATION OUR SPECIALTY.

ADOPTED BY REMINGTON AUTO. & MOTOR CO.



Oil Cups, Grease Cups, Oil Filters, Oiler Set Stands, Wrench Boards, Waste Boxes, Oiler Sets, Packing, Cylinder Glasses, Finished Machine Keys, Hall's Grease.

OFFICIAL SUPPLIERS TO ALL STORAGE AND SUPPLY STATIONS WHO WANT RELIABLE AND TESTED GOODS.

HALL MFG. CO., 40 Cortlandt St., NEW YORK, U. S. A.

"The Automobile and Motor Review"

Subscription, \$2 a Year

395 Broadway, New York

Automobile Machinery

Call and Inspect our Stock in the

Largest Machine Tool Showroom in the World

See the most prominent makes side by side

Also have the best of facilities for doing your
Experimental Work, Gear Cuttings, Etc. etc.

Correspondence Solicited

The Garvin Machine Co.

Spring & Varick Sts.

Phila. Store, 51 No. 7th St.

New York

10-12 H. P.

DOUBLE CYLINDER

Tonneau and Phaeton

GEORGES-RICHARD French MOTOR CARS

WINNERS OF 100 PER CENT. NON-STOP
CERTIFICATE IN AUTOMOBILE CLUB OF
AMERICA'S ENDURANCE TEST.

And were the ONLY Cars carrying 4 PERSONS and weighing under 2000 lbs. that
WON.

Three Speeds and Reverse. Direct drive on high speed. We have been able to secure only a limited number of these popular Cars.

General Motor Car Co.

239 West 50th St.,

Telephone 902 Col.

NEW YORK

Veeder Odometers

are furnished as a regular equipment by the following well known automobile manufacturers:

The "Locomotive" Co. of America,	Buffalo Electric Carriage Co.,
The St. Louis Motor Carriage Co.,	The Beardsley & Hubbs Mfg. Co.
Foster Automobile Mfg. Co.,	Baker Motor Vehicle Co., Cleveland, O.
The "Steamobile" Co. of America,	Thomas B. Jeffery & Co.,
The Kidder Motor Vehicle Co.,	National Vehicle Co.,
The Aultman Co., Canton, Ohio,	Stearns Steam Carriage Co.,
Olds Motor Works, Detroit, Mich.,	H. H. Franklin Mfg. Co.,
International Motor Car Co.,	Niagara Motor Vehicle Co.,
(Toledo Steam Carriage.)	Geo. N. Pierce Co.,
Ajax Motor Vehicle Co.,	Crest Mfg. Co., Cambridgeport, Mass.,
The Crowds Automobile Co.,	The Peerless Mfg. Co., Cleveland, O.,
John T. Robinson & Co.,	The Hoffman Automobile & Mfg. Co.,
The De Dion-Bouton Motorette Co.,	Cleveland O.,
Geneva Automobile and Mfg. Co.,	Warwick Cycle & Automobile Co.,
Electric Vehicle Co., (Gasoline Carriages.)	Springfield, Mass.,
	Marlboro Auto & Car Co., Marlboro, Mass.

ODOMETER
ONLY.

Special Attaching Fixtures
Made to Order.

CATALOGUE



MADE FOR

24,	26,	28,	30,
32,	34,	36,	38,
40,	41,	42,	44,
46,	48,	and	50

INCH WHEELS.

Makers of ODOMETERS, CYCLOMETERS, COUNTERS, FINE CASTINGS.

THE VEEDER MFG. CO., HARTFORD, CONN.

For Sale in New York by Chas. E. Miller, 97 Rensselaer St.

Tubular Steel Wheels



Strong - Neat - Durable

AMERICAN TUBULAR WHEEL CO.
PITTSBURG, PA.

Columbia ELECTRIC AUTOMOBILES



Columbia Tonneau Mark XIX

contain less than one-tenth the number of moving parts that are found in automobiles of other types and are proportionately easier and economical to maintain in perfect running order. They have the further advantages of the finest body work and furnishings produced in this country and complete interchangeability of mechanical and electrical parts.



Columbia Victoria

Before delivery, each of our batteries is tested for **FORTY MILES** on one charge. One-charge runs of over sixty miles have frequently been made by our vehicles.

Runabouts
Broughams

Surreys
Wagonettes

Victorias
Buses

Gabriolets
Delivery Wagons

Write for our latest catalogue

ELECTRIC VEHICLE CO., Hartford, Conn.



Incontestably
the Best

ARTICLE OF ITS
KIND EVER OF-
FERED TO THE
TRADE.
SAMPLE FREE
UPON APPLICA-
TION.

THE HOTELLING BROS. CO.

268 E. 35th St., Chicago, Ill.



"STANDARD" AUTOMOBILE SPECIALTIES

THEY are used exclusively by all of the leading Steam Vehicle Builders, because they have been carefully and thoroughly tested and are satisfactory. The Self-Contained feature of our gauge construction and superior material used, guarantees good results. We manufacture Steam and Air Pressure Gauges, Pop Safety Valves, Automatic Water Gauges, Gauge Cocks, etc. Send for descriptive circular.

Standard Gauge Mfg. Co.
SYRACUSE, N. Y.
New York Office, Room 221, 141 Broadway



With stem wind as illustrated . . . \$21.00
Revolving scale, not stem wind. . . \$18.00

Hicks's Altitude Meter

HICKS'S PATENT

HERE has been a universal demand for years among all classes of tourists for an accurate and inexpensive instrument to determine the altitude of hills and other eminences occurring on their line of route, yet sufficiently simple in its indication to be understood by anyone.

To meet this very popular enquiry, this instrument has been devised, which, by merely turning the Zero, or O, of the revolving dial round to where the indicating hand may happen to be at the time, one may in a few moments learn whether one is ascending or descending, and to what extent, even though it may be only a few feet. To everyone this information would at all times be interesting, but to the Motorist, who may be uncertain if his storage of motive force is sufficient to finish his journey, it should be exceptionally welcome. One other feature has been maintained by the manufacturer, and that is an exceptionally low price for what will prove a very useful instrument, the object being to bring it within the reach of everybody, whether indulging in pedestrianism, cycling or motor driving. **For sale by all jobbers.**

Imported by SUSSFELD, LORSCH & CO., 37 and 39 Maiden Lane, New York City

WHEN ANSWERING ADVERTISEMENTS, PLEASE MENTION THE AUTOMOBILE AND MOTOR REVIEW.

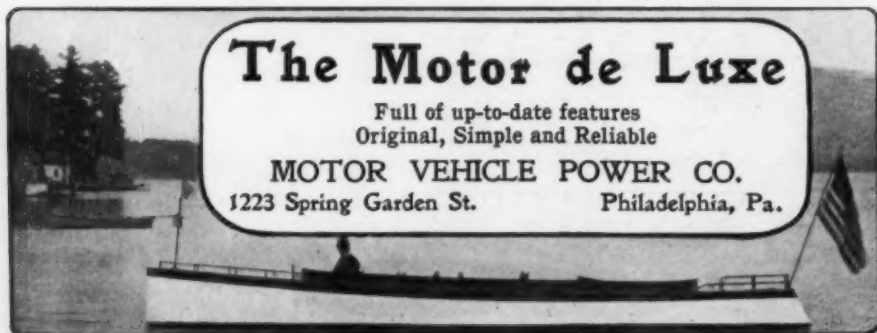


A Truscott Boat

Simple Safe Reliable Speedy

Made all sizes and styles from 16 ft. upward.
Engines 1 to 40 h.-p. Better boats or machinery cannot be made. Catalog for the asking.

TRUSCOTT BOAT MFG. CO.
BOX A :: ST. JOSEPH, MICH.



The Motor de Luxe

Full of up-to-date features
Original, Simple and Reliable

MOTOR VEHICLE POWER CO.
1223 Spring Garden St. Philadelphia, Pa.

"BUFFALO TONNEAU" MODERN GASOLINE CAR

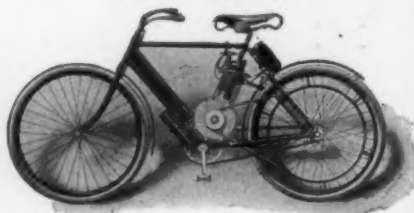


MODEL 18. PRICE \$800

FEATURES

THOMAS "AUTO-BI" THE ORIGINAL MOTOR CYCLE

MODEL 3. PRICE \$150



MODEL 4. PRICE \$175

Motor—Six horse power. **Truck**—Standard 4 feet 8½ inches. **Capacity**—Carries four people. **Roads**—Good on any. **Hills**—Climbs them all. **Speed**—25 miles per hour. **Comfort**—Long wheel base, easy riding.
Now Delivering All vehicles equipped with E. R. Thomas World's Record Motors **Shipping Daily**
BUFFALO AUTOMOBILE & AUTO-BI COMPANY, 1200 Niagara Street, BUFFALO

"COVERT MOTORETTE"

\$600.00



Neat, Comfortable, Efficient and Easily Operated
B. V. COVERT & Co., LOCKPORT, N. Y.

A Few Calls! Subscriptions! Extra Money!

THIS MEANS YOU!

Write us for terms
and instructions. . . .

The Class Journal Co.
395 Broadway, New York



C. R. Wilson Carriage Co.,
Detroit, Mich.

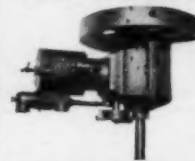
The GROUT

WINS ANOTHER

FIRST PRIZE

IN THE NEW YORK-SOUTHPORT RUN MAY 30TH.
GROUT BROS., Orange, Mass.

H. L. HOFFMAN MOTOR CO. JOLIET, ILL.



Manufacturers of Single 4
H. P., Double 7 H. P., Four
Cylinder 16 H. P. Gasoline,
Automobile or Marine, 4 cy-
cle Motors. Either Horizontal
or Vertical. Fully Guar-
anteed. Prices the lowest.
Your patronage is solicited.



ARE THE SAFEST CARRIAGES FOR
YOU TO OWN ❄️❄️ Send for catalogue

White Sewing Machine Company,
CLEVELAND, O.

This cut shows the tail-board down,
creating room for two additional pas-
sengers. When closed up, it makes
an ideal one-seated vehicle.



1902 PATTERN MADE BY THE
CINCINNATI PANEL CO.,
CINCINNATI, OHIO.

Our Local and Traveling
Representatives say

It's Easy Money

Subscriptions are coming in.
Are you with us?

For terms and instructions address

THE CLASS JOURNAL COMPANY
395 Broadway, NEW YORK



**Splitdorf
Coils**
That's all.
They tell the
rest.
C.P. Splitdorf
17
Vanderwater St.
NEW YORK



Lubricators, Oilers, Grease Cups, &c.
FOR GASOLINE ENGINES

WRITE US FOR PARTICULARS

The G. B. Essex Brass Co.
DETROIT, MICH.



For all types of Automobiles.
Indispensable to the Autoist.

SEND FOR SAMPLES

Joseph Dixon Crucible Co.
Jersey City, N. J.



Leather Clothing

For Automobile Use

WIND AND RAIN PROOF

Sold by One Dealer in Every City

WRITE FOR AGENCY

THE MILFORD COMPANY

MANUFACTURERS

MILFORD, MASS.



The standard acetylene lamps for
vehicles of all sorts for years have been

Solar Lamps

From the time of the introduction of
acetylene gas, there has been only one
lamp that would stand every test—
THE SOLAR.

The acme of Solar perfection is the new French auto-
headlight illustrated here.

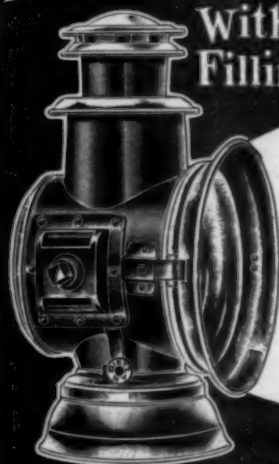
Our catalogue tells all about Solar Lamps of all kinds—send for it.

BADGER BRASS MFG. CO. :: :: Kenosha, Wis.

DIETZ AUTOMOBILE LAMP

Burns Kerosene, 24 Hours

With One
Filling.



An Automobile Lamp should have the follow-
ing qualities:

- 1st. It should be built strongly enough to stand the vibration and jar of machine and road.
- 2d. It should give a good light, so as to light up the road thoroughly.
- 3d. It should have a proper arrangement of draughts so that it will stay alight in spite of wind and jar.
- 4th. It should be easy to clean and care for.
- 5th. It should consume something which can be easily obtained anywhere.

The Dietz Lamp possesses all of these quali-
ties. The best way to prove (or disprove) this
statement, is to try it. We will take all the risk.

R. DIETZ COMPANY

33

Laight St, NEW YORK.

Portable Rheostats

which enable you to charge your storage batteries from any Edison station or trolley station, while touring.

Also equipments for private stables and for charging stables.

The Cutler-Hammer Mfg. Co.

MILWAUKEE, WIS.
136 Liberty Street, NEW YORK.
Monadnock Block, CHICAGO.

GOULD Storage Battery

FOR AUTOMOBILES



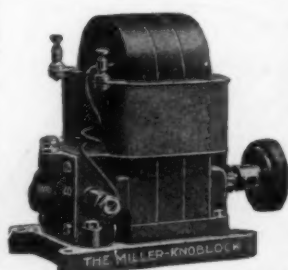
OVER
25,000
CELLS IN
SERVICE



GREATEST
MILEAGE
COMBINED
WITH
LONGEST
LIFE

GOULD STORAGE BATTERY CO.

25 West 33d Street, - - NEW YORK CITY



"Quick Action"

Igniting Dynamos Excel all others.

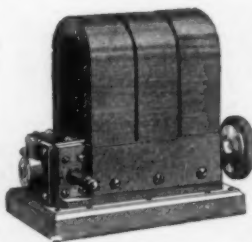
No spark coils; no batteries needed on Butt Spark Engines

It will operate with Jump Spark Coils. Send for Catalogue.

The Miller-Knoblock Electric Mfg. Co.

SOUTH BEND, INDIANA

THE NEW Henricks Igniter



IS SUPERIOR TO ALL OTHERS...

Especially adapted to Marine and Automobile Engines

Successfully works Jump Spark Coil

BOOKLET FREE

Henricks Novelty Co. 617-619 So. Illinois St. INDIANAPOLIS, IND.

H-U. 50^m Accumulators

Non-Infringing

Light Weight

Long Mileage

Durability

HELIOS-UPTON CO. CHICAGO, ILL.

ZECO GENERATORS

for sparking Gas and Gasoline Engines of all sizes and makes.

EXTRA QUALITY.

LOW PRICE.

Write for our Special Circular.

ZIEGLER ELECTRIC CO.,

141 Franklin Street, - - - Boston Mass.

We Lead the World...

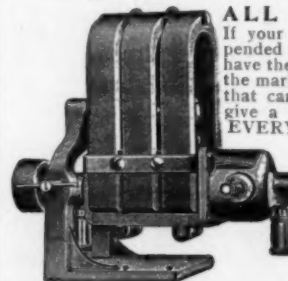
In the manufacture of Jump Spark Ignition Apparatus. Our catalog will convince you of this fact. Write for it.

AMERICAN COIL COMPANY

BOX 20

W. SOMERVILLE, MASS.

A Spark Every Time



ALL THE TIME

If your motor is to be depended upon, you ought to have the Best Dynamo on the market. You want one that can be relied on to give a satisfactory spark EVERY TIME, don't you? Not "ordinarily" merely, but "ALL THE TIME."

Write for our booklet—It's interesting.

"A LOT DEPENDS ON THE DYNAMO"
THE CARLISLE & FINCH CO.
223 E. Clinton Ave., Cincinnati, O.

THE DOW SPARK COIL



Do not experiment with companies who do not understand the first principles of Rhumkorff coil construction. The best is the cheapest in the end. Send for catalogue and prices to the

Dow Portable Electric Company,

218 Tremont St., BOSTON, MASS

1135 Broadway,
NEW YORK, N. Y.

1213 Filbert Street,
PHILADELPHIA, PA.

21 La Salle Street, CHICAGO, ILL.

NATIONAL BATTERY CO.,

OUR REPUTATION MADE ON MERIT.

NATIONAL STORAGE BATTERIES

PLANTÉ TYPE

ELECTROLYTICALLY FORMED

COMBINES LONG LIFE WITH GREATEST CAPACITY

The question of mileage for Electric Vehicles is easily solved by using National Batteries
Works and General Offices, Buffalo, N. Y. New York Office, No. 91 Fifth Avenue

Price List and Descriptive Catalogue furnished upon application

WORKS OPERATED WITH NIAGARA FALLS POWER

ORDER...

A COPY OF

The Construction of a Gasoline Vehicle

By C. C. BRAMWELL

PRICE \$2.00

Address Book Department
AUTOMOBILE AND MOTOR REVIEW
395 Broadway, New York

VOLT-AMMETERS



One Instrument Combines a Voltmeter and an Ammeter, and thus will thoroughly test batteries of all kinds. Also Circuits, etc.

**Accurate
Reliable
Various Ranges**

Send for circular

L. M. PIGNOLET

78 Cortlandt St.

NEW YORK

ALUMINUM

THE PITTSBURGH REDUCTION CO.

PITTSBURGH, PA.

Aluminum Automobile Parts a Specialty

We Manufacture Complete
Up-to-Date - - -

RUNNING GEARS

also Automobile Steam Engines

SEND FOR CIRCULAR

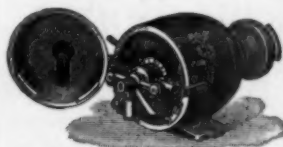
SHAEFFER, BUNCE & CO.,

Successors to SHAEFFER, BUNCE & MARVIN.

142 MAIN STREET,

Lockport, N. Y.

THE APPLE IGNITERS



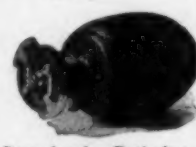
Door Open. Note easy means of access.

Mr. Automobilist, do you know that you are missing half the enjoyment of operating your machine if it is not fitted with this igniter? Does away with worry about how long your batteries will last, the jerking caused by missing explosions, and you can make more miles with the same consumption of fuel. If you are buying a new machine, specify this igniter. Send for printed matter.

THE DAYTON ELECTRICAL MFG. CO.

168 S. ST. CLAIR ST., DAYTON, O.

N. Y. stock carried by Chas. E. Miller, 97 Reade St.
Philadelphia Office, the Bourse. Chicago Office, 19-21 LaSalle St. St. Louis, A. L. Dyke, Linmar Bldg.



Door closed. Entirely enclosed. Water & dirt proof.

If Your Springs Are Giving You Trouble, Write Us



We are making a Specialty of a Strictly High Grade Spring for Automobiles. They are tempered in oil, and for easy riding and durability cannot be surpassed.

GARDEN CITY SPRING WORKS
CHICAGO, ILL., U.S.A.

Double sweep concord side springs are as good a style of spring as any made. They have stood the test of time.

We make them or any other style.

Established 1880



TUTHILL SPRING CO.
319 Clinton St. Chicago, Ill.

Patented
January
29, 1901

**GRADOMETER**

A SIMPLE INSTRUMENT that will enable you to tell the grade per cent. you are ascending or descending :: :: SENT ON RECEIPT OF \$1.50

THE ADAMS COMPANY :: :: DUBUQUE, IOWA, U.S.A.

IT'S A SECRET

how we manage to make perfect cylinder castings when so many other foundries fail. It took us ten years to learn it. All the leading gas and gasoline engine firms have their work done by us.

ERIE FOUNDRY CO., Erie, Pa.

PATTERNS FOR AUTOMOBILES

Having the Largest Facilities of Anyone in Our Line, We Can Take Care of Any Size Order for Any Firm Located Anywhere in the Country
BALKWILL PATTERN WORKS, 970 Hamilton St., CLEVELAND, O.

WE ARE THE LEADING MANUFACTURERS IN AMERICA OF

AUTOMOBILE PARTS

Engines, Boilers, Gears, Axles, Wheels and every part

to construct complete outfits, either steam or gasoline. Get the best by dealing direct



FOR WIRE WHEEL.

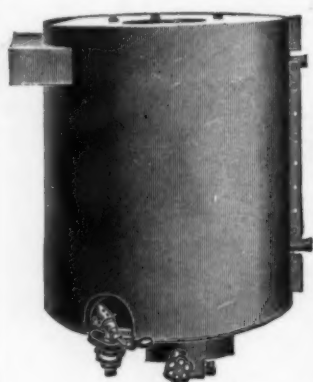
NEUSTADT - PERRY CO.

FOR WOOD WHEEL.

with the manufacturers.

WRITE FOR OUR NEW CATALOGUE, fully illustrating everything pertaining to the automobile trade

Neustadt-Perry Co. 826 to 830 S. 18th St., St. Louis, U.S.A.



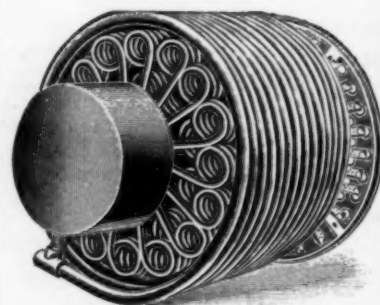
Salamandrine Boilers Cannot Burn out.

NO HILL TOO STEEP.

THE ONLY BOILER THAT WILL ACCUMULATE STEAM WHILE CLIMBING STEEP GRADES.

Send for Descriptive Pamphlet.

SALAMANDRINE BOILER CO.
220 BROADWAY, NEW YORK
WORKS: NEWARK, N.J., U.S.A.



Ofeldt Regulators

Have No
Packing
Boxes to
Leak

PRICE
\$5.50



Patented
1901

Weight
2 Lbs.

Most accurate fuel regulating device ever invented. Will positively regulate within two pounds. Diaphragm acts directly on fuel valve. SIMPLE and SENSITIVE. We guarantee satisfaction.

F. W. OFELDT & SONS
Foot of 25th St. BROOKLYN, N.Y.



Automobile and Marine
**Boiler Shells & Pressure
Tanks** SEAMLESS COLD DRAWN
SMOOTH STEEL

All diameters and any length
Write for New Illustrated Price List

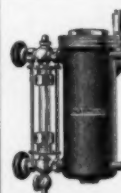
JANNEY, STEINMETZ & CO. 740 DREXEL BLDG.
PHILADELPHIA



BOILERS

The Oldest and Largest Automobile Boiler Company making Automobile Boilers exclusively. We know our boilers are the best made. Now making boilers for most of the steam carriage builders. Can make any kind. All work guaranteed. Write for particulars. Repair work economically done. Our boilers received first prize for lowest fuel consumption in Long Island Endurance Contest.

STEAM CARRIAGE BOILER CO., Oswego, N. Y.



Save Your Nerves

BY APPLYING A
Reliance Low Water Alarm
TO YOUR STEAM VEHICLE
SEND FOR ILLUSTRATED CIRCULAR
Reliance Gauge Column Co.
CLEVELAND, OHIO

THE ROLLER BEARING

W. S. ROGERS, VICE-PRES.
(Late Manager The Ball-Bearing Co., Boston)
KEENE, NEW HAMPSHIRE
Roller Bearings & Ball Bearings
OF ALL KINDS

Rims That Are Right!

MANUFACTURED BY

THE STANDARD WELDING CO.

Eastern Sales Agents
Miller, Thornburgh & Co.
135 Broadway, New York

CLEVELAND, OHIO

Chicago Office
1117 The Rookery

Why Not Give Your
Customer What He
Wants? The

Best Wood Wheels

AS MADE BY
Phineas Jones & Co.
301 to 313 Market Street
NEWARK, N. J.

... FOR ...

Automobilists

There's Nothing You want
We do not keep. 


The Largest Automobile and Cycle Supply House in America

CHAS. E. MILLER

Nos. 97-99-101 READE ST., NEW YORK CITY

Long Distance Telephone 3058 Franklin.

Manufacturer, Jobber,
Exporter and Importer

A Full Line of Sundries and Parts,
INCLUDING:
CAPS, GOGGLES, COATS,
DASHBOARD CLOCKS, HORNS,
LAMPS, BELLS, ODOMETERS,
OILS, AUTOMOBILE BASKETS,
ETC. 

A R B Roller Bearings

Are a Necessity for your Wheels and Rear Axle Casings

If you have used plain Bearings, Ball Bearings, or other Roller Bearings, and then tried the A.R.B., you can fully realize the truth of this statement. If not, you can save time and money by taking the experience of others.

.. . . LET US CONVINCE YOU

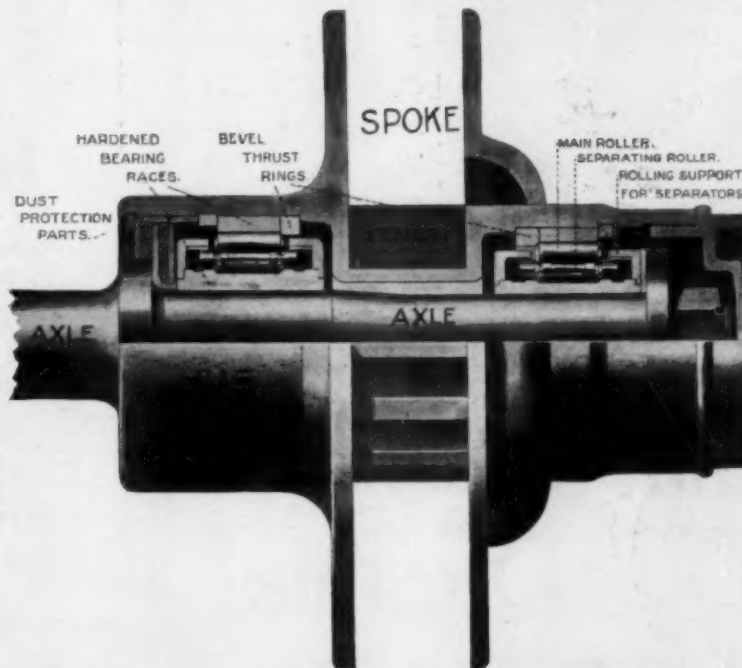
Let us design your Hubs and Rear Axles. We are doing it constantly for others. We know how it should be done. Try us.

To Manufacturers

If you are guaranteeing your machines, the A. R. B. is a necessity.

If you are looking for future business, the A. R. B. will help you get it.

If you are designing your first machine, consult us, and we will give you all possible assistance.



To Users

If you are intending to purchase an auto, study the bearing question.

If the machine you desire has not the A. R. B. in its wheels and rear axle casings, you will have trouble.

If you want the best, specify AMERICAN ROLLER BEARINGS. We GUARANTEE them

A R B ARTILLERY HUBS

With wood work by the Phineas Jones Co. of Newark, N.J.

Make a Perfect Wheel

Try this combination once and you will be convinced.

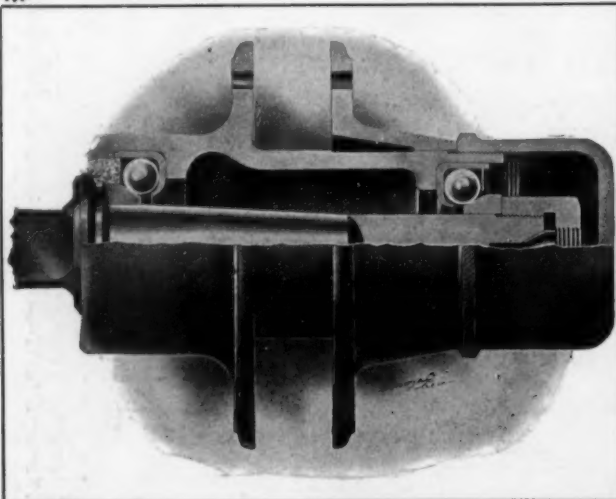


American Roller Bearing Co.

Offices and Factory 32-40 Binford St., BOSTON, MASS.

Artillery Wheels

We are now prepared to furnish these Hubs, Ball-Bearing and Key-Seated, for automobiles weighing from 500 to 4,000 pounds. Front Hubs are Ball-Bearing and are assembled on our well-known Steering Axles. Rear Hubs furnished with Ball-Bearings or Key-Seated. ALL RACES ARE GROUND IN POSITION IN HUBS.



CONES AND
CONE-SEATS ON
SPINDLES ARE
GROUND TO
GAUGE.

Hubs and Spindles
are Machined
Right and Left.

WRITE US REGARDING
YOUR REQUIREMENTS

The American
Ball-Bearing Co.
CLEVELAND, O.
U.S.A.



Speedy
Durable
G & J Tires

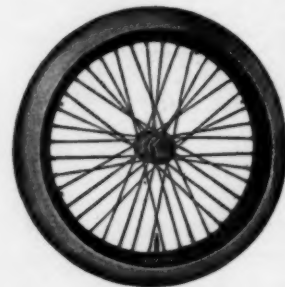
No lugs or cement used. Punctures are easily repaired.
Ride easier and wear longer than any other vehicle tires.

G & J TIRE CO.
INDIANAPOLIS

Makers of G & J Detachable Tires for all classes of vehicles

Wire Wheels Steel Rims Steering Devices

Buy a Standard Article



The one that is the Best of
Its Kind

The one that is Stamped with
the name—and

“ GUARANTY ”

Weston-Mott Co.
UTICA :: :: N. Y.

Wheels any Diam. for any Sec.
tire, for Vehicles weighing from
300 to 2800 lbs. Send in Specifica-
tions for Special Quotations

The "International" Air Pump

formerly the "Detroit" Air Pump, has been adopted by the "Mobile" Company of America as regular equipment to "Mobiles." For further information address

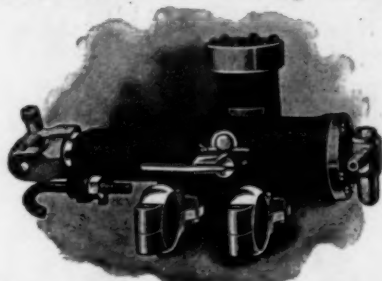
The "International" Air Pump Company
180 Times Building, New York City

Monogram Oils & Greases

Specially adapted for Automobile Lubrication
Write for catalog and price list

Columbia Lubricants Co. 22 Burling Slip
NEW YORK

Reason Automatic Air Pump FOR STEAM VEHICLES



Keeps the air pressure in the fuel tank whenever desired automatically, without care or attention. We also make the REASON JR. AIR PUMP "Non-Automatic," which is controlled from the seat of the wagon. Write for circulars and description. Eastern Agents: Chas. E. Miller, 97 Reade St., New York. Spalding Bedwell, 29 W. 42d St., New York. (Post & Lester, Hartford, Conn.)

**LIGHT AND MEDIUM WEIGHT
MALLEABLE
IRON CASTINGS
TO ORDER.**
PROMPT SERVICE. SMOOTH AND
WELL ANNEALED CASTINGS.
THE
CHISHOLM & MOORE MFG Co
CLEVELAND, OHIO.

Mr. Manufacturer

We have brought out a new form of CARBURETTOR, in which all the faults of the old-style devices have been eliminated — a carburettor simple in construction, positive in action, accessible and having a SIGHT-FEED, which enables you to KNOW — not guess. Write

The Axiom Carburettor Mfg. Co.
106 E. 28th St., New York

STANDARD

INGLE DOUBLE
TUBE TUBES
TIRES TIRES

"Born for Success
with those qualities which win"

Hartford Dvnplop Tires AND Tires

Have Stood Pre-eminently Foremost Since the Introduction of Pneumatic Tires

Few devices have been the subject of a greater inventive faculty or more persistent and successful exploitation, and few have reached such a high state of development.

**They Never Vary in Quality or Workmanship Because
They Cannot Be Made Better or of Better Materials**

If the BEST is none too good for you, it will pay you to adopt these widely and most favorably known tires. Every user is bound to be satisfied with them.

True Economy Represents Buying the Best Wherever You Can Find It

We Also Manufacture
THE TURNER ENDLESS SOLID TIRE
for very heavy vehicles. Particularly adapted for use where proper strength is required and length of service is guaranteed.

**THE HARTFORD RUBBER
WORKS COMPANY**
Hartford, Conn.
U.S.A.



It's Easy Money soliciting subscriptions to the "Automobile and Motor Review"
For information address Class Journal Co., 395 Broadway, New York

I t's All In The Tire...



IN the principal of construction as well as in the material, **Goodyear Detachable Tires** are properly designed and properly made.

The result is a tire that cannot slip or creep, and requires neither bolts, lugs or cement, that is more resilient than any other made.

The $1\frac{3}{4}$, 2 and $2\frac{1}{2}$ inch tires are for special steel rims and intended for motor vehicles of 1,000 lbs. or less.

The $2\frac{1}{2}$, 3, $3\frac{1}{2}$, 4 and 5 inch tires are for wood wheels or wire wheels with wood rims, and for heavy automobiles.

OUR CATALOG WILL GIVE YOU MORE INFORMATION

GOODYEAR TIRE & RUBBER CO.

AKRON, OHIO, U.S.A.

.. THE ..
Cleveland Wire Spring Co.

CLEVELAND, OHIO

Manufacturers of

**HIGH GRADE, OIL TEMPERED
Spiral Steel Wire Springs**

OF ALL DESCRIPTIONS



Metal FENDERS Hoods & Bonnets

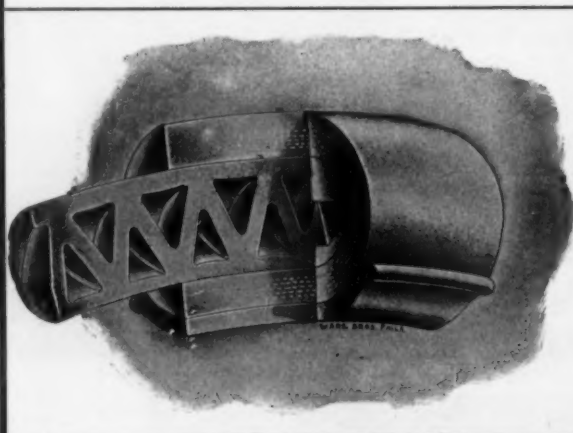
Are Right in Our Line
Our GOODS ARE RIGHT
So are our prices
Write us

EASTMAN METALLIC BODY CO.
184 KINSMAN ST. :: CLEVELAND, OHIO

Beasley Elastic Tires

TRUSS CONSTRUCTION

FOUR SIZES— $2\frac{1}{2}$ in. x 28 in. and 30 in. 3 in. x 28 in. and 30 in. 5 or 8 Lugs



A PERFECTLY successful resilient tire for all purposes. Beasley Tires are nearly as resilient as pneumatic Tires, and cannot be disabled by punctures. They will render perfect service until the tread is completely worn out, and at all times insure certainty of transportation. They will eliminate the expense, and that which is of more importance to the consumer, the annoyance of repairs incident to all Pneumatic Tires, and will wear three times as long.

The Beasley Elastic Tire is constructed on the principle of a truss bridge, and therefore is strong, durable and resilient. Its construction secures perfectly the integrity of the rubber used in the elastic section. This tire possesses advantages over the Pneumatic and Solid Tires that will quickly present themselves to the users of Rubber Tires. The Solid Tire that will wear is neither resilient nor elastic, and cannot be made to meet either

of these essential features without sacrificing wearing qualities. The Pneumatic is the only Tire possessing perfect resilient qualities, but its susceptibility to puncture makes it very uncertain and dangerous in use, especially on horseless vehicles. The most important features of the Beasley Elastic Tire are its resilient qualities and the absolute certainty of transportation which it secures to its users. Nothing short of its total destruction will disable it so that it cannot be used for safe transit. Prices on application.

Standard Anti-Friction Equipment Co.

50 BROADWAY, NEW YORK, U.S.A.

What INDIA Implies!

New and original ideas.
The best goods in the market.

Prices that are consistent with high grade materials.

A variety of Automobile Tires that no other concern can produce.

Ask for information about **Wheeler Endless** solid tires and **India** pneumatics.

The India Rubber Co.

AKRON, Ohio



RADIATING COILS

FOR GASOLINE CARRIAGES

Special Designs Built to Order Promptly

TUBE BENDING MACHINE CO.

10 Gouverneur Slip, NEW YORK

SHELBY

SEAMLESS STEEL TUBING

SAFEST and BEST for
Automobile Construction

Shelby Steel Tube Co., Pittsburg, Pa.

Randolph=Clowes Co.

WATERBURY, CONN.

Brass and Copper Rolling Mills

AND

Seamless Tube Works

Seamless Copper Shells

FOR

AIR, GASOLINE AND

MUFFLER TANKS

Copper Tubes and Shells

FOR

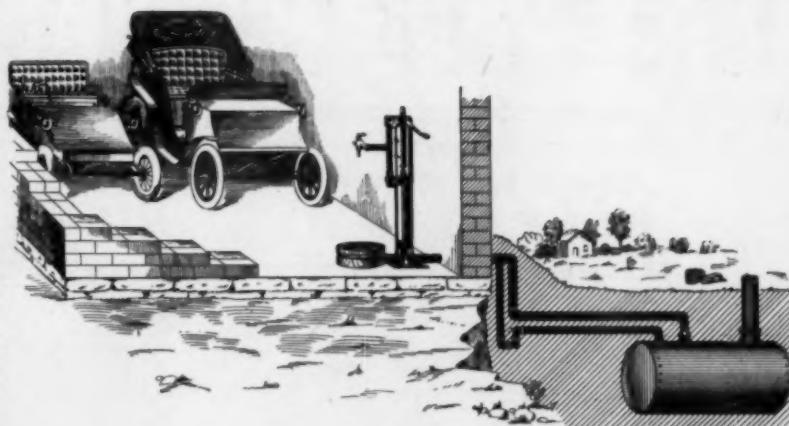
AUTOMOBILE BOILERS

BRANCH OFFICE

NEW YORK CHICAGO
715 Postal Tel. Bldg. 603 Fisher Bldg.

The Bowser Long Distance Outfit

TANK IN THE GROUND



PUMP IN BUILDING

PUMP MEASURES GALLONS, HALF GALLONS and QUARTS
TANK OF RIVETED STEEL

MEETS THE CORDIAL APPROVAL OF UNDERWRITERS
LESS THAN ONE GALLON OF GASOLINE IN THE BUILDING
THE BEST AND FINEST OUTFIT EVER OFFERED

SEND FOR CATALOG B

S. F. BOWSER & CO.

(INCORPORATED)

FORT WAYNE - - - - - IND., U. S. A.

Standard Oil Co. Stove GASOLINE

STOVE Gasoline made by the Standard Oil Co. is *especially* adapted for use in automobiles, locomobiles, naphtha launches, marine and stationary engines.

For *safety, speed* and *economy* specially treated naphtha is necessary for machinery above mentioned.

Our Stove Gasoline has peculiar advantages for these uses, due to improved methods of manufacture, and can be obtained from dealers in any town or city in the United States.

FOR FULL INFORMATION ADDRESS
STANDARD OIL CO.

The Forg Gasoline Burners

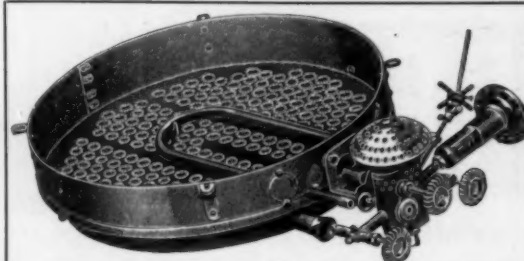
Are the **BEST CONSTRUCTED**, give a **BLUE FLAME AND MORE HEAT** than any other burner manufactured

Burners for 14, 16 and 18-inch Boilers made with single compartment.

Burners for 20, 22 and 24-inch Boilers made with three compartments.

Special sizes and shapes made to order.

Write for descriptive catalogue.



3 Compartment Burner with Generator and Regulator

PETER FORG, Somerville, Mass.

WOODWARD BURNER TALKS

— No. 2 —



Last week we made the statement that the **WOODWARD BURNER** would generate more heat with less gasoline than any other burner made, but to make the comparison more definite:—

In an actual 200 mile test run with a **WOODWARD BURNER** that had been in constant use for seven months, the consumption of gasoline averaged one gallon to fifteen miles.

With all other burners on the market the average is one gallon to eight or ten miles.

In other words the **WOODWARD BURNER** will enable you to cover **FIFTY PER CENT. MORE TERRITORY** with the same amount of gasoline than any other burner made.

The burner can be taken apart and put together with nothing more than a **wrench and screw-driver**. Each tube is independent of the top plate and can be removed at will.

THE WOODWARD BURNER & SPECIALTY WORKS, 1112 W. Washington St., Indianapolis, Ind.

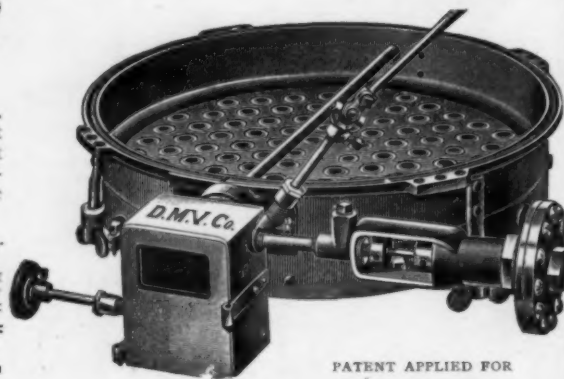
"The DAYTON" BURNER

One-Piece Cast Iron Burner. Can't Warp or Leak. Will not Burn Back or Blow Out. Pilot Light Burns Constantly. Generator and Pilot Light can be Attached to Other Burners..

Send for Descriptive Circular

We Make Engines, Boilers, Running Gears and a Full Line of High Grade Steam Fittings for Automobiles. :: ::

The Dayton Motor Vehicle Co.
DAYTON, OHIO

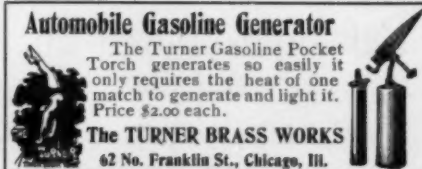


PATENT APPLIED FOR

Automobile Gasoline Generator

The Turner Gasoline Pocket Torch generates so easily it only requires the heat of one match to generate and light it. Price \$2.00 each.

The TURNER BRASS WORKS
62 No. Franklin St., Chicago, Ill.



The ADAMS-McMURTRY Company

HAVE REMOVED TO

317-319 WEST 59th STREET

Near Central Park NEW YORK CITY



The "BRUTE"

The largest Cylinder Oiler made for Steam Vehicles

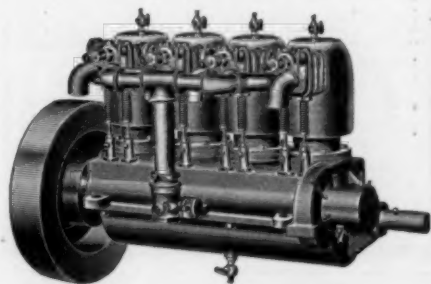
Send for new Catalogue "C"

**ENGINES, BOILERS, BURNERS
REGULATORS, Etc., Etc.**

Locke Regulator Co.

SALEM, MASS., U.S.A.

THE
Rutenber Manufacturing Co.
(INCORPORATED)



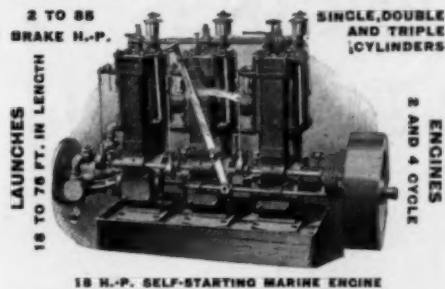
Manufacturers of the

"RUTENBER"
Upright Gasoline Motors

for Automobiles, Launches and Stationary Use. Both Air and Water Cooled. From 1 to 150 Horse Power. Also AUTOMOBILES of every style, DELIVERY WAGONS, OMNIBUSES and HEAVY TRUCKS.

Room 1104, 184 La Salle St., The Temple, Chicago

WOLVERINE MARINE ENGINES



18 H.P. SELF-STARTING MARINE ENGINE

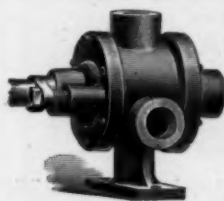
WOLVERINE MOTOR WORKS,
GRAND RAPIDS, MICH.

Gas and Gasoline Engines and Supplies

ABSOLUTELY EVERYTHING

Cavanaugh & Darley, 20 W. Randolph St., Chicago

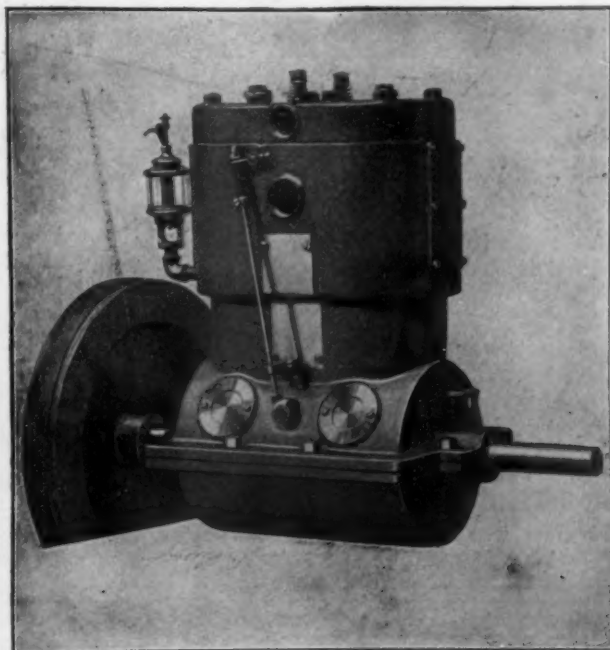
MANUFACTURERS: We want agency for new articles in our line. Write us.



Is Your Circulation Good?
THE LOBEE PUMP
increases and gives a positive circulation to the cooling water for all Gasoline Motors. Simple, Cheap, Durable, Efficient, easy to apply. Sent on trial to responsible parties.

LOBEE PUMP & MACHINERY CO.
138-144 Terrace, Buffalo, N.Y.

An American Motor for Americans!



NOT a FOREIGN
REPRODUCTION



**Howard Hydro
Carbon Motors**

..FOR..

**Automobiles
and Launches**

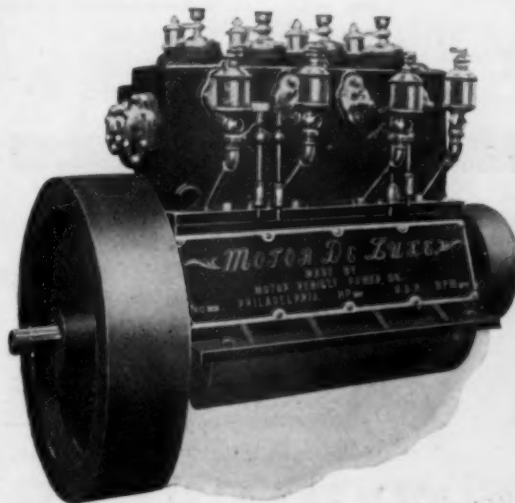
GRANT-FERRIS CO., TROY, N. Y.

THE MOTOR DE LUXE

8 H. P.

Four Cylinders, Shifting Spark
on all Cylinders without a Chain

Especially adapted to the
Touneau Type Automobiles



Motor Vehicle Power Co.,

1227 SPRINGGARDEN ST.,

PHILADELPHIA

WE PAY the same commission on
old and new subscriptions, and
are in the market for your services.
Write us for Terms and Territory.
The Class Journal Co., 395 Bdy, N. Y.

The Medal Winner at the Pan-American

Best
Design

Best
Made

Best
Finish

Best
Service



Lightest
Weight

Strongest
Made

Most
Durable

Best
Control

The Lightest Draw Bar Pull of any Vehicle Made
The Most Efficient of all Electric Vehicles

Baker Motor Vehicle Co.

CLEVELAND, O.

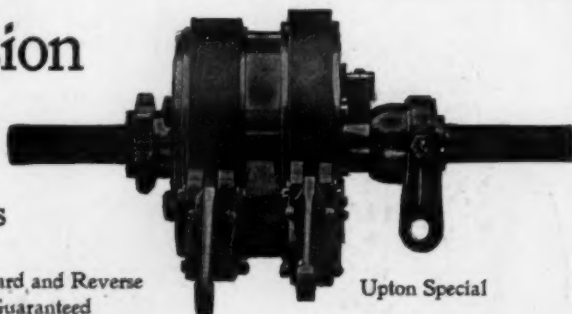
Send for Catalog

Dealers Wanted

Transmission Gear...

For Automobiles

Two Speeds Forward and Reverse
Satisfaction Guaranteed



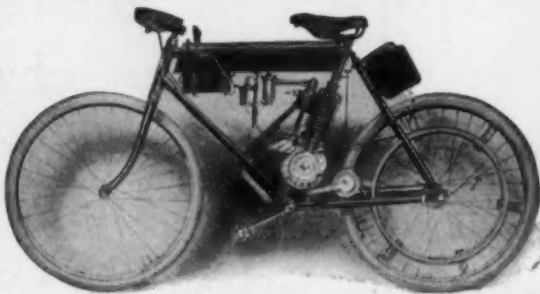
Upton Special

Upton Machine Co. (Works at
Beverly, Mass.) 17 State St., New York

MARSH MOTOR CYCLE

This is the most practical and reliable Motor Cycle ever built. If you have not written for our catalogue, do so at once.

**MOTORCYCLE
MFG. CO.**
Brockton, - Mass.



The Story of an Automobile

CHAPTER VII.

Transmission !!!

Gears make more noise than anything on an automobile; they require constant adjusting. In emergencies, when power is needed, gear teeth have a habit of stripping. We don't use them. We drive with chains, which require little attention. When necessary, a novice can adjust.

(To be continued)

The Beardsley & Hubbs Mfg. Co.,
Shelby, Ohio

Ellwell-Parker Carriage Motors

MOST PRACTICAL MOST EFFICIENT
LOWEST WEIGHT

WRITE US FOR PARTICULARS

The Ellwell-Parker Electric Co., Cleveland, O.

Lathrop Marine Motors

Sizes, 2½, 3½, 4½, 5½, 6½, 7½, 8½ and 9½
Horse Power

J. W. LATHROP
MYSTIC, CONN.

WE ARE MANUFACTURERS OF

ENGINES STEAM and GAS

FOR AUTOMOBILE AND MARINE WORK

Send for our catalogue and let us figure on your work.

B. & P. COMPANY 128-130-132 Ferry Street
Milwaukee, Wis.



NOYE MFG. CO.
BUFFALO, N. Y.

Gasoline Motors
Single—Double—Triple,
2 to 20 HORSE-POWER
On Hand for Immediate Shipment

MASON

IS THE NAME OF THE BEST

**AUTO ENGINES
AND
APPLIANCES**

SEND FOR FREE ILLUSTRATED CATALOG

THE MASON REGULATOR CO.
158 Summer St., BOSTON

CRESTMOBILE

Price
\$550
and
\$600



Agents
Wanted

MANUFACTURERS OF
MOTORS PLUGS COILS
Crest Manufacturing Co.
CAMBRIDGE, MASS.

Fenders for Oldsmobile
Fenders for Locomobile
Fenders for Mobile

AUTOMOBILES from \$400 up

Rochester Automobile Co.
JOS. J. MANDERY, Prop.
ROCHESTER, N. Y.

THE Toledo

Steam Carriage

Is built in a factory which covers five acres of ground. The buildings have a surface area of 249,000 square feet. All drawings, patterns, castings, dies and forgings are made on the premises. All machine and carriage work is done in the best possible manner by means of latest tools and methods in our own works. The phrase "Toledo Quality" covers this construction. Unrivalled facilities permit immediate shipment on standard models

INTERNATIONAL MOTOR CAR CO. :: :: Toledo, Ohio

BRANCH AGENCIES

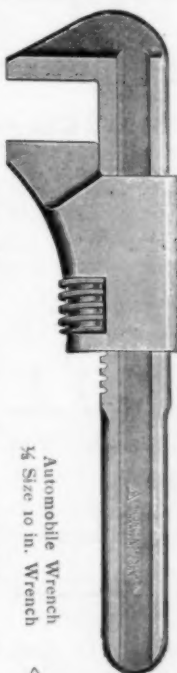
NEW YORK BRANCH, 91 Fifth Ave., New York City. BROOKLYN BRANCH, 342 Flatbush Ave., Brooklyn, N. Y. BOSTON BRANCH, 225 Columbus Ave., Boston, Mass. PROVIDENCE BRANCH, 158 Snow St., Providence, R. I. HARTFORD BRANCH, Hartford, Conn. WASHINGTON BRANCH, 517 14th St., N.W., Washington D. C.

Wrenches and Steering Equipment Forgings

In stock to supply your immediate wants. The B. & S. 10 in., 14 in. and 18 in. Adjustable Automobile Wrench has attained great popularity, and no equipment is complete without it.

The Model 97 Adjustable Bicycle Wrench is the standard the world over and the best to be obtained.

Models A, B & C Adjustable Pocket Wrenches are celebrated for Beauty, Strength and Efficiency. Our trade mark on every Wrench. Send for circulars. A & W.



Automobile Wrench
1/2 Size 10 in. Wrench

The Billings & Spencer Co. Hartford, Conn.

LONDON OFFICE: No. 8 Long Lane Aldersgate St., LONDON, E.C.

The Conrad Steam Carriage

Large Water Capacity Auxiliary Throttle
Patent Pilot Light
Machinery Hung on Angle Iron Frame

Surreys
Dos a Dos
Stanhopes
Runabouts



Our Model 60 Stanhope. Price, \$800.00

Our Agency is a desirable one. Agents will do well to write for catalogue and discounts.

THE CONRAD MOTOR CARRIAGE CO.
BUFFALO, N. Y.

GASMOBILES



American Built Immediate Deliveries

LOOK UP OUR RECORD

First Prizes and Blue Ribbons wherever shown

Stanhope, Tonneau and Wagonette Types

Strong and Simple Construction. Three and Four Cylinders. Best Type of Ignition. Latest style of Igniters. Easy to Control. Always Reliable. Best Hill Climbers Built. Prices to Suit the Purchaser.

WE INVITE INSPECTION

Send for Descriptive Bulletins

Automobile Company of America

Factory and Offices

MARION (Jersey City) N. J.



WOODRUFF

LADIES' DELIGHT

WE HAVE IT

AND IT'S A DANDY

WOODRUFF

Medium Light Gasoline Machine

STRONG—SIMPLE

COMPACT

IT APPEALS TO EVERY ONE

Write us at once

**The
Woodruff Automobile Co.
Cleveland, Ohio**



"Champion Accumulator"

An Ignition Battery Specially
Adapted to Either

**AUTOMOBILES
MOTOR CYCLES or
MARINE ENGINES**

Send for
Booklet

H. C. MacRAE, Baltimore, Md.

Recharging Automobile Motors

SEND FOR CIRCULAR

For sale at a bargain, 1 new Electromobile, Stanhope body, 2½ H.P. recharging motor and controller. Send for particulars.

LINCOLN ELECTRIC CO.

World Building

CLEVELAND, OHIO



NEW MODEL 6

ELMORE

Vertical double cylinder motor, 3 speeds forward and reverse. Speed of carriage controlled by throttle. Latest design box front. Simple, practical and efficient. Agents wanted in unoccupied territory

Elmore Mfg. Co., Clyde, O.



If you want to **work**, buy a gasoline or steam machine. But **you** want a machine for **recreation—pleasure**.

The NIAGARA Electric Carriage

will give you both. It is a gentleman's carriage—easy to handle and to keep clean. You can wear **good clothes** when you use our electric carriages.

Does this appeal to you?

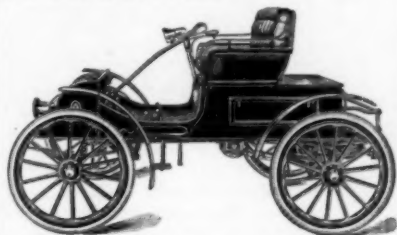
Send for illustrated booklet and prices.

The Niagara Motor Vehicle Co.

121 Grant Street, BUFFALO, N.Y.

TRY IT AND YOU WILL BUY IT

THE FRIEDMAN ROAD WAGON, point for point, is the equal of any gasoline Automobile sold in the U.S. for \$1,200, and is the only machine equipped with a Double Cylinder Four Cycle Balanced Engine that retails for less than that amount.



They will climb any grade up to 30%, and develop any speed up to 30 miles per hour. Absolute and instantaneous control. Every engine guaranteed to develop six horse-power.

Our price this year \$750.00.

Hung on platform springs front and rear.

Friedman Automobile Company

3 East Van Buren Street
Chicago, Ill.



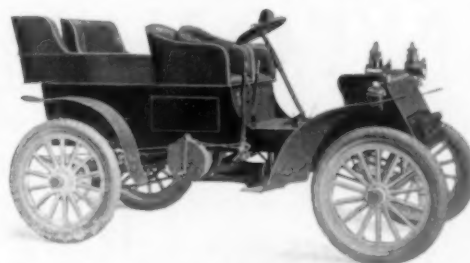
Model 50

**NATIONAL
ELECTRIC
VEHICLES**

**NATIONAL
VEHICLE
COMPANY**

Indianapolis
Indiana
2100
East
Twenty-
Second
Street

**BE
WISE
GET
OUR
AGENCY**



THE Packard Tonneau.

"An examination of the carriage failed to show anything loose or out of order, and there is every reason to suppose that this vehicle could have successfully completed, without a stop, another hundred miles with the supplies it originally had without any adjustment or attention whatever."

Albet L. Clough.

SEE ACCOUNT LONG ISLAND ENDURANCE RUN, PAGE 536 HORSELESS AGE.

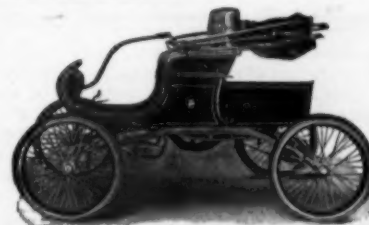
OHIO AUTOMOBILE CO., WARREN, OHIO.

CHICAGO, Pardee & Company, 1404 Michigan Boulevard.
BUFFALO, Ellicott Evans, 84 White Building.
PHILADELPHIA, Rudolph & Winslow, 302 N. Broad Street.
BOSTON, H. B. Shattuck & Son, 239 Columbus Avenue.
NEW YORK, Adams, McMurtry & Co., 317 W. 59th Street.

OLDSMOBILE GASOLINE RUNABOUT

runs noiselessly, starts from seat, climbs steep grades and requires little attention while being operated.

What you have been looking for. It is a year ahead of the times and in a class by itself.



Olds Motor Works, 1297 Jefferson Ave, DETROIT, MICH.

STEARNS GasolineAutomobiles

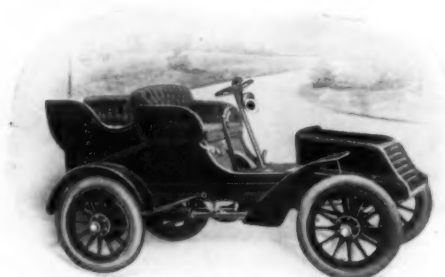
Euclid & Lake View Aves. CLEVELAND, O.

Tremper's Automobile Agency.

New and second hand vehicles of all makes bought and sold. Bargains in Olds, Gasmobiles, Wintons, Darracqs and Mobils. Special facilities for the speedy sale of machines by weekly mailing lists. Storage within 10 minutes of City Hall.
150 NASSAU ST., New York.

WINTON TOURING CAR

Both Wintons entered in the Long Island 100-mile non-stop endurance contest, made 100 per cent. exhibitions. To each was awarded a blue ribbon.

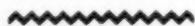


TOURING CAR, TONNEAU DETACHABLE.
PRICE COMPLETE \$2,000.

The Winton Touring Car (Class D—less than 2000 lbs.) captured first honors and the silver cup award in the hill climbing contest.

"A PRONOUNCED LEADER IN DURABILITY AND EFFICIENCY."

GET OUR CATALOG.



The Winton Motor Carriage Co.

CLEVELAND, OHIO, U. S. A.

Branches and agencies throughout the country.

The "New Era" MOTOR CAR

Simple, Reliable and Efficient. Will carry two or four people anywhere. Total weight, 950 lbs. Weight of motor, developing 7 actual horse power, 240 lbs. Easy to start. No cranking necessary. Practically noiseless. No vibration. Three gallons of gasoline sufficient for a ten hour run. Speed from 5 to 25 miles per hour. Price, \$850 f.o.b., Camden, New Jersey. AGENTS WANTED EVERYWHERE

Write for **TERMS & DISCOUNTS**

THE AUTOMOBILE and MARINE POWER CO., Camden, New Jersey



The Construction of a Gasoline Motor Vehicle

BY C. C. BRAMWELL

\$2.00

Address Book Dept., The Class Journal Co.
395 - 399 Broadway :: New York City

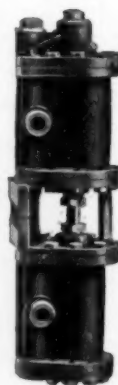
\$2.00

The VICTOR Steam Carriage



Reliable Automatic Features
Correct Mechanical Principles
Write for full Technical Description
Agents Wanted Everywhere

The Victor Steam Pump



Size, 9 inches by 3 inches.
Weight, 4½ pounds.
Capacity of Air Pump, 80
pounds pressure on tanks
or tires.
Capacity of Water Pump,
3 gallons per minute
against 200 pounds boiler
pressure.

PRICE \$30.00 EACH

These pumps have been adopted
by the Locomobile Co., the Mobile
Co., and other leading manufac-
turers of steam carriages.

The Victor Grade-Meter



The grade is shown by the location of a
bronze ball running in a graduated con-
cave tube filled with spirits.

Price, \$1.25 Postpaid

Overman Automobile Co.

7 EAST 42d STREET
NEW YORK

A**G A I N****!!****100%**LONG ISLAND
ENDURANCE
CONTEST**100%**A. C. A.
ENDURANCE
CONTEST*Searchmont*

A GAIN Victorious. Three cars started in the Endurance Contest of the Automobile Club of America on Memorial Day, and all of them finished the 100 miles without a stop.

If you would know more about

AMERICA'S LEADING AUTOMOBILE

Write us.

FOURNIER - SEARCHMONT AUTOMOBILE CO.

1234 ORHNEY STREET, PHILADELPHIA, U.S.A.

Prescotts Receive First Class Certificates

In the Automobile Club of America's 100-mile Endurance Contest on Decoration Day between New York and Southport, Ct., and return, the Prescott Steam Cars were awarded First Class Certificates.

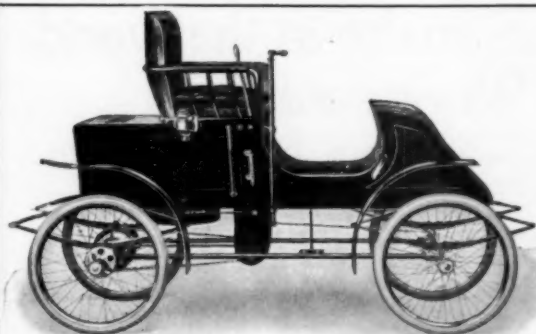
In the Speed Trials on Staten Island Boulevard, May 31, one of the Prescotts that made the Endurance Run—a regular stock car—nothing special on it, made the mile in 1.37 1-5, thus proving conclusively that the Prescotts are *safe, speedy and reliable*.



4 Passenger Open Front.

WHEEL BASE, 68 INS.

WEIGHT, 1250 POUNDS



2 Passenger Closed Front

Boiler Will Not Burn Out
Heavy Running Gear
Two Double Acting Brakes
New Indestructible Burner
Large Fuel Supply
Large Water Capacity
Engine Encased
Superheated Steam

Pilot Light that Holds Steam at
any Desired Pressure
Folding Dash
Automatic Lubrication
American Roller Bearings
Steam Air Pump
Steam Water Pump

WHY NOT PURCHASE AN AUTOMOBILE THAT HAS PROVEN
RELIABILITY UNDER ALL CONDITIONS? WRITE FOR CATALOG

PRESCOTT AUTOMOBILE MFG. CO.

83 Chambers St., New York

*The ONLY Automobile that has
Won EVERY ENDURANCE CON-
TEST Held in America is the*

HAYNES-APPERSON

The most practical Automobile in the World
WE WON THE 100-MILE NON-STOP TEST ON MAY 30 AS USUAL



RUNABOUT \$1200
6 horse-power, 2 passengers

PHAETON \$1500
9 horse-power, 2 passengers

SURREY \$1800
9 horse-power, 4 passengers

WE offer a proved efficiency and reliability, ease of access to working parts, and simplicity of operation not afforded by an other make in the world, at a moderate cost for the Finest Workmanship.

LOOK UP OUR RECORDS ✱ ASK OUR CUSTOMERS ✱ GET OUR CATALOGUES FREE

HAYNES-APPERSON CO.
KOKOMO, IND., U.S.A.

Proof of Merit and Offered **ONLY** by **Immediate Delivery** **DARRACQ CARS**



WEEKLY IMPORTATIONS

provide instant delivery and assure the latest modern devices, improvements and **styles**

OUR RECORD

The **best** proof of merit.

47 FIRSTS

Out of 52 races in 1901.

WINNER

Of Annual French Hill Climbing Trials, at Gaillon Hill, Nov. 1901.

SEASON OF 1902

Automobile week of Sports at Nice, out of 15 entries, the **first five cars** to finish were **all Darracq Cars**.

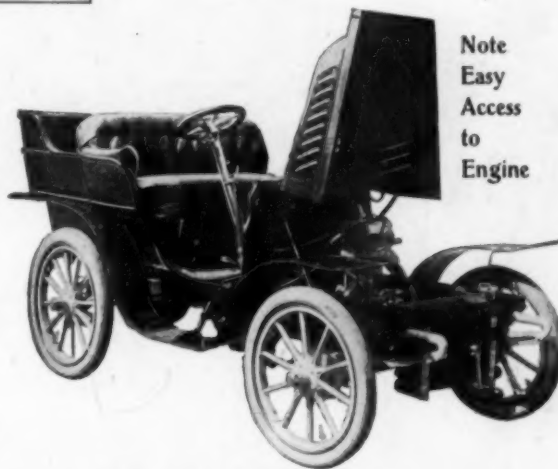
Paris to Arras and return, 560 miles. Darracq Cars were first in **Both Light Car Classes** in 13 hours 3 min. 22 sec.; averaging 43 miles per hour.

Special Trial on Turbie Hill, a 20 h.-p. Darracq beat record made by 40 h.-p. Mercedes, by 51 sec.

In 550 to 880 lbs. class, Darracq was first.

In 880 to 1320 lbs. class, first six cars were Darracq.

IN AMERICA.—We have won **Every Endurance Contest** held since importation began, including the 100-mile non-stop trial on May 30th, where we were also the **first two to finish**.



Note
Easy
Access
to
Engine

Governed Motor. Three Speeds and Reverse. Weight, 1300 @ 1600 lbs. Direct Drive. Ample Power. Accessibility. Reliability. Single @ Double Cylinder. 9 @ 16 h.-p. Touring Cars

AMERICAN DARRACQ AUTOMOBILE COMPANY

OFFICE AND WAREHOUSES
652 Hudson Street, New York City

NEAR 14th ST. STATION
9th AVENUE "L"

F. A. La ROCHE
Sales Manager

Packards
are
Continually
Keeping
Ahead.
Reliable.
Durable.
Simple.

4

FIRST CLASS
 CERTIFICATES
 NEW YORK-BUFFALO
 ENDURANCE RUN.



2

STANDARD MACHINES (above model)
 COVERED LONG ISLAND 100 MILES
 WITHOUT STOP IN RECORD TIME
 WINNING HIGHEST HONORS.

BOSTON,
 H. B. SHATTUCK & SON.
 239 COLUMBUS AVE.

OHIO AUTOMOBILE CO.
 WARREN, OHIO.

CHICAGO.
 PARDEE & CO.
 1404 MICHIGAN BOUL.

EASTERN DEPT. ADAMS-MCMURTRY CO. 317 W-59th ST NEW YORK.